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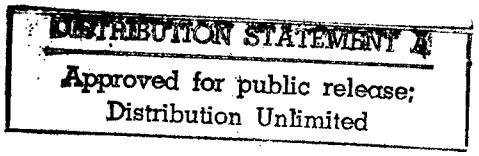
Science & Technology

Europe
Economic Competitiveness



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Europe

Economic Competitiveness

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92BR0552 Antwerp DE FINANCIEEL-EKONOMISCHE TIJD in Dutch 12 Jun 92 p 12

[Article signed V.H.: "Umberto Agnelli: Europe Cannot Face Competition With Present Infrastructure"]

[Text] Lisbon—According to Fiat Vice President Umberto Agnelli, Western Europe's infrastructure is inadequate to achieve its ambitions as an industrial and economic superpower. The problem of ensuring sufficient mobility of persons, goods, and information has become so critical that it might affect Europe's competitiveness.

The Portuguese government took the initiative to organize a congress about these problems in Lisbon that was attended by EC Commissioners Bangemann [industry] and Van Miert [transportation]. In Lisbon, Agnelli gave a detailed explanation of an initiative taken by the European Round Table (ERT) for the improvement of Europe's infrastructure. Within the ERT, Agnelli is chairman of a working group on this subject.

The ERT project fits within the EC Commission's proposals in the field of transportation, telecommunications, and energy infrastructures which have been incorporated in the Maastricht Treaty under the heading of "TransEuropean Networks." Agnelli argued that, in the future, large-scale infrastructure works would have to be financed with private capital and with toll collection proceeds. Agnelli said that this could be achieved by coordinating the activities of industry, financial institutes, and public authorities. Possible partners could be private investors, insurance companies, and pension funds.

In the medium- to long-term, Agnelli anticipated the formation of specific trusts which would be responsible for funding, executing, and managing these investments. According to Agnelli, this is completely in line with the plans for a European Monetary Union.

In the initial stage, Agnelli called for the establishment of a European Center for Prospective Analysis on Infrastructure, which would be tasked with listing all infrastructure-related problems. This list would be used to build a database which would provide the relevant authorities with the information needed to evaluate requirements.

The European Commission is expected to finance the operation of this European Center, which would accommodate authorities responsible for transportation and infrastructure, such as countries, regions, large cities, etc. Companies or businesses which are involved in financing or executing infrastructure works would not be allowed to join the Center.

Answering the question whether Fiat would be interested in participating in such projects, Agnelli answered that Fiat badly needs its capital assets to finance the ambitious investments of its automobile and truck departments. Moreover, it should not be forgotten that the Fiat group has its own insurance companies, such as Toro Assicurazione and Augusta Assicurazione, with an annual turnover of 42 billion Belgian francs [BFr]. Agnelli added that another positive aspect of such initiatives would be the fact that citizens would at least see actual and tangible examples of the unified Europe in the form of new or improved infrastructures which are beneficial for both the population and the region. According to Agnelli, a typical example of such projects is the extension of mixed road/rail cargo transportation, whereby international cargo trucks would be loaded on trains.

The idea to finance infrastructure works with private capital is not new, according to Agnelli. At the end of last century, railway construction was financed to a large extent using private capital, and it was Fiat, for instance, which financed the construction of the Milan-Turin highway. These shares have by now been taken over by Torino Milano Autostrada Spa and they are presently quoted on the stock exchange.

German Economics Minister Discusses R&D Budget for Eastern Laender

92MI0583 Bonn DIE WELT in German 13 Jun 92 p 10

[Text] The German Ministry of Trade and Industry is providing 292 million German marks [DM] in funding this year for industrial research and development, and innovation in eastern Germany. As Trade and Industry Minister Juergen W. Moellemann stated in Berlin on Friday, the goal is to reverse the trend of declining research activities.

Moellemann emphasized that the number of those working in the sector of industrial research and development in the new laender has decreased to less than one-third of the 74,000 employed at the end of 1990. In order to maintain this R&D potential therefore the Ministry of Trade and Industry must provide subsidies for a transitional period.

According to a ministerial report, the R&D situation is especially critical in industries that have not yet been privatized. Problems are also being experienced by the research companies that are no longer part of the 57 corporations still controlled by the trust agency and that can only be partly privatized. Unfortunately, at the end of June the trust agency will no longer handle R&D issues from its central office in Berlin, leaving further talks about industrial research to the branch directorates and regional offices.

Moellemann further explained that R&D funding was necessary to complement the investments made in

eastern Germany and was optimistic that the high level of investment funding in the new laender will be maintained until 1996.

The German government is expected to make important decisions on 1 July 1992, with the approval of the 1993 budget and medium-term financial plan. Moellemann pointed out that public investments per capita in eastern Germany are currently 130 percent of investments in western Germany while private investments are only 48 percent.

DASA's Schrempp Calls for Industrial Policy

92WS0624A Duesseldorf HANDELSBLATT in German 16 Jun 92 p 22

[Unattributed article: "We Do Not Need a MITI, But Rather an Industrial Policy"]

[Text] Berlin, 15 Jun (HANDELSBLATT)—"At the ILA [International Air and Space Show] high technology is demonstrated which also serves to a large extent for the improvement of the quality of life. However, this high technology needs a minimum of acceptance. It cannot simply be turned on and then turned off again a short time later. Industry lives on 15- to 20-year eras."

Chairman Juergen Schrempp of Daimler's subsidiary Deutsche Aerospace AG (DASA) stated this at the company's press conference. It was particularly well attended under the current circumstances, probably because of the Jaeger 90, which—according to Schrempp's Solomonic statement—will be built in any event—with or without German participation. Furthermore, DASA's chairman does not believe that Germany or Europe needs a Japanese-style MITI [Ministry of International Trade and Industry], but they do need "an industrial policy in the most positive sense."

According to Schrempp, because of the fact that national markets no longer exist, alliances and cooperative capabilities are extraordinarily important. They require the introduction of know-how which must be developed. Technological equality is the absolute foundation of alliances. The German aviation industry is currently accepted internationally as an equal.

On the theme of cooperation with the Netherlands's Fokker, Schrempp is still assuming that there is a good chance for an agreement before the summer break. A common goal is to make Europe more powerful in global competition. There is an overlap between regional aircraft and the smallest Airbus A319 at the bottom and top end with 3 to 4 percent of the overall program.

With regard to the Jaeger 90, Schrempp explained that if this country needs an aircraft to contribute to the defense of the continent, a domestic product would always fit the bill better than a foreign alternative. Moreover, DASA has offered to guarantee the price quoted. And furthermore, it is essential to consider the question of the outlook for jobs, the technical aspects of the problem, and German suitability for alliances. To the question of when the wooden mockup of the Jaeger 90 would be turned over to the Berlin Transportation Museum at Mayor Diepgen's request, Schrempp replied: "After delivery of the aircraft to the Luftwaffe."

In space as well it is a question of billions [of German marks [DM]]. According to a new design of the ESA program, a DM200 to 300 million annual difference remains concerning the appropriations in the budget, the difficult situation of which is well known. "We should participate in GUS," according to Schrempp. DASA is already conducting about 50 relatively small projects with GUS. We are profiting from knowledge about orbital stations, among other things. There is also cooperation in spacesuits, telecommunications, and in materials.

Germany: 1993 BMFT Budget Summarized

92MI0658 Bonn TECHNOLOGIE NACHRICHTEN-MANAGEMENT INFORMATIONEN in German 10 Jul 92 pp 2-4

[Text] The government bill makes provision for 9,603 billion German marks [DM] for the 1993 BMFT [Federal Minister of Research and Technology] budget (increase over the previous year: 3.8 percent, compared with the projected 1992 budget of DM9.254 billion, excluding the DM90-million supplementary budget for 1992). When considering the growth rate of the BMFT budget it must be borne in mind that it will not be financing renewable raw materials in 1993, as they will be transferred to the budget of the Federal Ministry of Food, Agriculture, and Forestry. Federal Finance Ministry individual budget 60 makes a further DM272 million available for the continuation in 1993 of the BMFT's share in the university renovation program in the new federal laender. Of this, DM222 million are intended to finance the continuation of the scientist integration program etc., and DM50 million are allocated to a new investment program to benefit nonuniversity research facilities in the new laender. Taking all these resources together, therefore, the BMFT will have more than DM9.9 billion at its disposal for 1993.

To go into greater detail, the following main areas of emphasis had been identified, explained Federal Research Minister Riesenhuber:

- Expansion of research in the new laender, for which DM1.75 billion are available in 1993 (compared with DM1.6 billion in 1992, increase: 9.4 percent). In addition to funding for the nonuniversity research institutions, emphasis will be on backing R&D in small and medium-sized enterprises.
- Continuation of the long-established practice of setting research policy priorities, taking account of the latest developments in domestic and foreign policy, e.g.:—maintaining basic research at a high level; this accounts for just under 40 percent of the BMFT budget;—further expansion of preventive research, in particular ecological, climate and atmospheric, and

health research. Research will thus be able to contribute effectively to implementing the resolutions of the Rio de Janeiro environmental conference. This expenditure now accounts for 18 percent of the BMFT budget, whereas the figure was 9.2 percent in 1982;—backing the strategic technologies of the 21st century that will affect our industrial competitiveness. Research is already addressing new, intelligent technologies that will not be ready for application until the next decade, or even the one after. At 6.5 percent, the increase in funding to DM256 million for the key area of strategic technologies for the 21st century will be disproportionately high in 1993;—continuing European collaboration in space research, with a view to drawing up a new ESA [European Space Agency] program to take account of the changes on the world political scene over the last three years;—increasing collaboration with the countries of Eastern Europe, especially in space technology.

1. Principal Research and Technology Funding Priorities

BMFT technology and innovation will lay particular emphasis on the strategic technologies of the 21st century. These are mainly information technology, materials research, biotechnology, power engineering, and traffic engineering. Examples of new areas of research are the development of new functional materials, thin-film technology, nanotechnology for the creation of the minutest structures, and bioinformatics.

As regards information technology, it must be borne in mind that additional EC resources amounting to DM470 million are expected to complement BMFT funding in 1993, and that Deutsche Telecom will increase its telecommunications research spending from about DM380 million in 1990 to approximately DM900.

One preventive research funding priority will be the new federal laender. One-third of the environmental technologies project funds will be used for environmental salvaging projects in 1993. In line with the conclusions of the Rio environment conference, funding for climate and atmospheric research will be further increased, by 8.2 percent to DM165 million, having already risen by well over 1,000 percent since 1982.

As regards energy research, new technologies to increase power station efficiency have been advanced with state backing to such an extent in recent years that they are now ready for market. This also applies to a great extent in gas and steam power station technology, especially coal-fired. State funding can therefore be reduced. Funding for nuclear power research is being concentrated on research work on reactor safety, on inherently safe reactor designs, and the final storage of radioactive substances. A sum of DM268 million is to be used for shutting down and dismantling the nuclear research facilities set up in the sixties and seventies. The '1000 Roofs Program' for decentralized photovoltaic electricity generation is being continued under renewable energy sources. The decrease in funds for "renewable energy sources and rational power consumption" is mainly due to the fact that responsibility for funding renewable raw materials is being transferred to an agency that is to be newly established under the Federal Ministry of Agriculture.

In line with last year's plans, funding for European space research will be increased by DM70 million. This increase is intended to enable the federal government, as resolved in Munich, to negotiate with its European partners in ESA on a new space program to:

- take account of the changed world political situation with its enhanced prospects for cooperation;
- set new priorities, especially in earth observation as a means of global environmental protection;
- exploit rationally the capacities that have been built up to date in industry and science, and, finally,
- represent a compromise for all member countries as regards financing capacity, even under the changed economic conditions.

Collaboration with the CIS will be increased. A considerable proportion of the increase for basic research relates to the continued growth of the institute in the new laender.

2. Research Budget Trends Broken Down According to Type of Funding

The 13 major research establishments in the original federal laender absorb the greater part of the resources available under BMFT institutional funding. A ceiling of DM2.3 billion (plus wage and salary increases in excess of 3 percent) will be placed on these funds over the next few years. Three major research establishments will be rapidly built up in the new federal laender:

- The Leipzig-Halle environment research center, which uses the results of research into pollutants to develop measures for cleaning up polluted areas, and to advise reclamation officers;
- The Max Delbrueck Center for Molecular Medicine in Berlin-Buch, which is applying new scientific approaches to basic research with a view to developing new integrative concepts for the diagnosis, treatment, and prevention of diseases, and subjecting them to clinical testing;
- The Potsdam Georesearch Center, which will deal comprehensively with all earth science disciplines, including, in particular, seismic research.

There are also eight branches of existing major research establishments in the new federal laender, bringing the total workforce employed by the major research establishments in the new federal laender to 1,700. Furthermore, the BMFT shares the costs of supporting 24 "Blue List" research establishments and four branches, with a total of about 3,300 employees, with their respective host laender, each contributing 50 percent.

The Fraunhofer Society has set up nine institutes and 12 branches with 1,050 staff in the new federal laender, and the Max Planck Society has established two institutes, 28 teams, and seven centers with a total of 900 staff. The research topics cover the entire spectrum of the natural sciences and the humanities. A total of 7,130 staff work for these federal/land institutes. The area of responsibility of the BMFT also encompasses about 1,900 scientist posts under the Scientist Integration Program, and 2,125 scientists from the former Academy of Sciences working on job-creation projects. Research institutes falling under the jurisdiction of other ministries also employ 2,350 staff members between them.

The institutional funding of the institutes in the new federal laender will absorb about DM730 million from the BMFT budget in 1993.

This institutional funding is supplemented by the BMFT's DM272 million contribution to the University Renovation Program for the new laender, which is entered in individual budget 60 and is administered by the BMFT. In addition to temporarily taking over part of the laenders' expenditure on Blue List institutes, this sum includes DM171 million earmarked for the Scientist Integration Program, which is to be continued until 1995, with the federal being gradually phased down. In addition, a four-year investment program for the nonuniversity research facilities is scheduled to start in 1993. The federal government is offering the laender a DM500 million per annum BMFT contribution to the new investment program for nonuniversity research facilities, with each laender contributing the same amount to the program, bringing the total volume for 1993 to 1996 to DM400 million.

Research and technology funding (BMFT share of institutional funding, project funding under specialized programs, and the university renovation program) in the new laender will total about DM1.75 billion in 1993.

BMFT project funding will also be in the region of DM4 billion in 1993, of which DM1.8 billion will probably be earmarked for projects undertaken jointly with private industry.

About a third of BMFT project funding, DM550 million, will go to small and medium-sized enterprises (SMEs) in the private sector. SMEs receive about three times as much funding as major companies in relation to their own R&D expenditure. Particular priority is given to funding for SMEs in the new federal laender, where the following special programs have been successfully launched:

- funding for young research personnel with a view to stepping up corporate technology development;
- contract research (east and east-west), i.e., the performance of research and development work on behalf of third parties;
- support for newly established technology-oriented enterprises.

These funding measures are designed to help SMEs in the new laender create or sustain their own research and development bases, thus enabling them to compete successfully on the German and European markets.

1993 BMFT BUDGET

Profile	Government Draft for 1993	1993 Share in Individual Budget	Increase 93/92	Projection for 1992
Funding Area/Program	DM Million	Percent	Percent	DM Million
Individual Budget 30, Total	9,602.7	100	3.8	9,254.0
1. Basic Research Relevant to Several Programs	1,674.0	17.4	7.5**	1,557.0
Basic Financing for Max Planck Society	622.8	6.5	12.2	555.0
Major Basic Research Facilities	1,051.2	10.9	4.9	1,002.0
2. Long-Term State Programs	2,351.5	24.5	3.9	2,263.2
Marine Research	129.9	1.4	0.6	129.1
Polar Research	70.6	0.7	-3.6	73.2
Space Research and Technology	1,815.9	18.9	4.5	1,737.0
Nuclear Fusion Research	206.1	2.1	0.3	205.4
Earth Sciences (especially deep drilling)	129.0	1.3	8.9	118.4
3. Preventive Research	1,729.1	18.0	6.7	1,621.3
Ecological Research	288.3	3.0	7.6	268.1
Environment Technologies	260.0	2.7	-3.2	268.7
Climate and Atmospheric Research	165.1	1.7	8.2	152.6
Health-Related R&D	512.0	5.3	7.2	477.6
Labor and Technology	83.5	0.9	-5.8	88.7
Protection of Monuments	35.0	0.4	-15.5	41.4

1993 BMFT BUDGET (Continued)

Profile	Government Draft for 1993	1993 Share in Individual Budget	Increase 93/92	Projection for 1992
The Humanities; Social Science	138.1	1.4	7.3	128.7
Cross-Sector Activities (30 million of which for the CIS)	247.1	2.6	26.4	195.5
4. Technology and Innovation Funding	3,939.7	41.0	0.8	3,908.5
Basic Financing for Fraunhofer Society	364.3	3.8	9.9	331.6
Marine Engineering	47.8	0.5	-21.3	60.7
Coal and Other Fossil Energy Sources	107.8	1.1	-17.4	130.6
Renewable Energy Sources and Rational Power Consumption***	348.1	3.6	-9.8	386.0
Nuclear Energy Research	325.3	3.4	-4.7	341.3
Secondary Costs of Nuclear Research Establishments	268.5	2.8	18.9	225.8
Information Technology (including production engineering)	1,014.9	10.6	1.9	995.7
Biotechnology	296.9	3.1	-2.1	303.3
Materials Research	258.3	2.7	3.5	249.5
Technologies of the 21st Century	256.3	2.7	6.4	240.8
Aviation Research and Hypersonic Technology	203.1	2.1	-3.9	211.3
Earthbound Transport and Traffic Research	169.1	1.8	0.1	169.1
Safeguarding Raw Materials Supplies	0.9	0.0	-64.0	2.5
Innovation and Improved Framework Conditions	187.0	1.9	14.0	164.1
Technical Information	91.4	1.0	-5.1	96.4
Overall Reduction in	-180.0	-1.9	0.0	-180.0
Federal Ministry	88.4	0.9	5.2	84.1
Individual Budget 30, Total	9,602.7	100	3.8	9,254.0
University Renovation Program in Individual Budget 60	272.0		20.4	226
Individual Budget 30 + Individual Budget 60 (URP)	9,874.7			

*Excluding supplementary budget for 1992, **Due in particular to new R&D establishments in the new laender, ***After redirecting funds for renewable raw materials to individual budget 10 (Federal Ministry of Food, Agriculture, and Forestry)

Germany: Small, Medium Firms Face Problems in Joining EC Programs

92MI0662 Bonn TECHNOLOGIE NACHRICHTEN-MANAGEMENT INFORMATIONEN in German 29 Jun 92 pp 15-16

[Text] There are still obstacles to the participation of small and medium-sized enterprises (SMEs) in the EC promotion programs. This is the conclusion reached by the Federal Association of German Industry (BDI), even though the participation of SMEs in certain promotion programs of the EC has risen considerably in recent years. In the second R&D program, for example, they accounted for 79 percent of all the ESPRIT projects, 53 percent of all the projects in the first BRITE/EURAM appeal, and 72 percent of all the FLAIR projects.

In order to increase the momentum even more, the BDI is proposing that the SMEs, whose innovative power is often underestimated, be involved to an even greater extent in future Community projects by means of practical and streamlined funding conditions. These are the key SME-related points of a BDI policy paper on the European research and technology policy.

The methods developed for this purpose by the EC commission over the past few years are correct in terms of their approach and must be developed further. The feasibility premiums in the BRITE/EURAM program have proved to be suitable for entry into the EC promotion programs and it would seem to be appropriate to use them in other programs, relevant to industry. An effective means of promoting cooperation by SMEs in research and technological development is the setting up of an industrial Community research body. The EC commission has, therefore, seized the initiative of the Industrial Research and Development Advisory Council

(IRDAC) by starting a pilot phase for a European Community research program (CRAFT).

A solution has yet to be found to the problem of the very expensive and time-consuming application procedures with which not only the SMEs but also larger industrial partners have to contend. Careful preparation of an application is often made more difficult by short tender periods and very late publication. The general introduction of a two-stage application procedure, already being tried out in the pilot phase of CRAFT, could help to remedy this situation. The relatively large expense of the conventional procedure would not, therefore, be required until the second stage when the applicant's chances of success are more assured because his project has already been agreed to in principle. Funding and project times must justify the expense of the application.

Germany: SPD Deputy on Research Priorities, Savings

92WS0665B Munich SUEDDEUTSCHE ZEITUNG in German 11 Jun 92 p 38

[Interview of Wolf Michael Catenhusen (Social Democratic Party (SPD)), chairman, Bundestag [Lower House of Parliament] Research Committee on Cost-Cutting Programs for Major Research Institutions, by Martin Urban; place and date not given; under the rubric "Asked": "Less Money for Science"]

[Text]

[Urban]: The federal research minister has to economize. Now the major research centers are being hit by this, where the number of employees is to be severely cut. With 15,600 planned positions, the number of staff members is to be reduced by 1700 to 1900 by 1995. Is this reasonable?

[Catenhusen]: It is reasonable to think about whether we can continue large-scale research to the extent thus far. The answer depends on the need we will have for large-scale research in the future in order to solve our problems. Unfortunately only one of the finance minister's targets is being put through fiscally here, without a strategic plan for the future of major research institutions.

[Urban]: If one looks at where the ministry wants to cut and where it will even give an increase, one can also discern political objectives from this. Polar research and oceanography, heavy ion research, cancer research and high-energy research will be winners. The nuclear research centers in Karlsruhe, Juelich and Geesthacht as well as the Society for Mathematics and Data Processing are losers.

[Catenhusen]: Politics was played here relative to individual institutions. But the question of the contribution large-scale research is to make in the future to the development of new technologies and to solving problems of the 21st century has not been answered. For there would also be new major tasks for the future for large-scale research.

[Urban]: What is in your opinion the real reason for the desperate situation Heinz Riesenhuber is in now?

[Catenhusen]: The importance of the research budget has been underestimated in the process of unification. Already today there is a shortage of 1 billion German marks [DM] in the research budget. That is, the necessary flexibility to tackle new tasks of science and research policy has been lost, and it is absurd that in a situation where the need for science and research for solving our social problems is growing, the percentage share of research outlays in the federal budget has dropped for years.

[Urban]: Now the federal research minister has saddled himself with tasks which he himself said are not justifiable in terms of research policy, and which he knew cannot pay. I mean manned space research. What is the state of affairs at the moment here?

[Catenhusen]: The research budget is also in a crisis because outlays that are not justifiable in terms of science and research policy, like manned space flights, for example, are being paid for out of the research minister's pots. We have in this year the last opportunity to prevent at least the worst, and yet we are pushing through the task of the major projects of the Hermes space shuttle and the Columbus space laboratory. If we do not take advantage of this opportunity, the research budget will continue to be mobile and maneuverable for years to come. In any case the rate of increase for the research budget for 1993 and 1994 has already been locked in at 1.1 percent in the old budgetary planning. In the U.S. the Bush administration's budget draft recommends a 7 percent increase in research outlays in the civilian sector. We have gotten into a dangerous cockeyed situation, viewed internationally also.

[Urban]: Would you say that the federal research minister has failed with his policy?

[Catenhusen]: The elbowroom of our research policy to make new creative efforts has been lost.

[Urban]: Which conclusions should one draw from all this?

[Catenhusen]: Long overdue is a strong protest by the German scientific organizations that this curtailment of public funds represents a danger to long-range future opportunities for industry, and also for the solution of social problems in Germany.

[Urban]: The president of the Max Planck Society just stressed this again.

[Catenhusen]: Yes, but in a very reserved manner. Consideration of greater emphasis on research will first start again at Helmut Kohl's cabinet table when there is pressure from science.

[Urban]: So, the research minister is basically not to blame for the desperate situation, but the federal chancellor who decides the policy guidelines?

[Catenhusen]: The research minister has to fight more strongly so that research policy regains appropriate importance in domestic policy.

Italy: Industrial Research Expenditure Declines

92MI0684 Milan ITALIA OGGI in Italian 7 Aug 92 p 7

[Text] The Italian technological balance of payments deficit for technology transactions with other countries has progressively deteriorated in recent decades, plummeting from 7 billion lire in 1956 (in current lire) to 717 billion lire in 1989. This snapshot from the Milan Chamber of Commerce, which is based on CNR [National Research Council] statistics, is accompanied by a somewhat discouraging picture on R&D investments in Italy: Among the seven most industrialized countries, Italy ranks last with 1.36 percent of its GNP going to research in 1989. This percentage is not only lower than that of the other six countries, but even lower than the EC average for the same year (1.95 percent). According to a survey carried out by the EC commission, the three most advanced countries in the OECD (United States, Japan, and Germany) in addition to two smaller countries, Switzerland and Sweden, allocated roughly 3 percent of their GNP for research. Though Italy spends a considerable sum on military programs (at least until the last year surveyed), it ranks last even in civil R&D with an expenditure of 1.1 percent compared to an EC average of 1.7 percent. Getting back to the technological balance of payments deficit, the CNR study highlights how the deficit increased at rates peaking at more than 300 percent per year up to 1985. From 1985 to 1987, the trend reversed with income exceeding expenditure, but from 1987 to 1989 (the last year surveyed) the trend worsened once again. In terms of economic areas, Italy's technological transactions with the leading countries show a consistent deficit with the OECD, where the United States alone accounts for approximately 70 percent of the deficit, followed by France with 25 percent. Instead there is a constant balance of payments surplus, as the report emphasizes, with developing countries and those with a planned economy (prior to the fall of the Berlin wall and the principal communist regimes), while transactions in the technological sector with Japan were very modest, with figures generally showing a slight surplus in favor of Italy. The branches of the economy most exposed to foreign penetration are pharmaceutical chemical products, industrial machinery (including computers), rubber products, plastics, and technologies used in commerce and tertiary services.

German Government Provides More S&T Program Funding for Eastern Laender

92MI0685 Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German 13 Jul 92 p 5

[Text] At a meeting of the Federal/Laender Commission on Educational Planning and Research Funding [BLK] in Bonn on 9 July 1992, federal and land governments decided to increase funding for the University and Research Renovation Program in the new Laender [HEP] by 667 million German marks [DM], DM500 million to come from the federal government and DM167 million from the laender. The Federal Minister of Research and Technology [BMFT] is providing DM350 million of the federal government's contribution.

The federal government offered the new laender a 38 percent increase in its contribution to the HEP, from the previous DM1.32 billion to a total of DM1.82 billion. The additional funding to be provided by the BMFT is earmarked for two measures:

—Extension of the Scientists' Integration Program [WIP], which previously covered only 1992 and 1993, to a total span of five years ending in 1996, at the same time extending, by one year, the deadline for integration into the universities to 31 December 1993. The intention is to absorb around 2,000 of the former Academy institutes' employees, accredited by the Science Council, into the new laenders' universities to enhance university research. A total of DM150 million of additional federal funding is available for this purpose for the period 1994-1996. To implement this program, the new laender will set up job pools, so that their existing employees will not be adversely affected by the absorbtion of additional personnel.

—A special investment program for non-university research institutions will be created, with DM200 million in additional federal funding plus land funding totaling DM67 million, for building, renovation, and equipment from 1993 to 1996. These measures will considerably enhance the productivity of the newly created research facilities ("blue list," Max Planck institutes, major research establishments, Fraunhofer Institutes, and individual land facilities).

The original renovation program, as agreed on 11 July 1991, envisaged total expenditure of DM1.76 billion over a five-year period, to be borne by the federal government and the new laender in a 75:25 ratio. The program provides immediate support for the universities in recruiting new personnel and making new investments, and for creating a productive research structure in the new laender and east Berlin. Federal government responsibility for the program is shared between the Federal Minister of Education and Science and the Federal Minister of Research and Technology.

EC Increases Budget for Regional S&T Development Program

92BR0687 Paris FTS in French May-Jun 92 p 1

The STRIDE [Science and Technology for Regional Industrial Development in Europe] program falls within the Community's policy of upgrading the infrastructure and technological capacity in the least developed regions.

In 1992-93, some 27 percent of the EC's total budget will be allocated to structural funding programs; this is one outcome of the signing of the European Single Act which introduced the concept of "Economic and Social Cohesion" on which the Maastricht Treaty laid such emphasis. If the Commission achieves its objective of a substantial increase in funding for improvements in structure and cohesion, it will account for a much greater proportion of the budget (by about 4 percent) in 1993. Hence, large amounts will be available between 1994 and 1998 and the money spent on research and technological development will depend to some extent on the results of programs such as STRIDE.

Like STAR [Special Telecommunications Action for Regional Development], STRIDE is one of the EC's initiative programs, for which the Community lays down the overall objectives and decides on funding. Member states then draw up specific projects for the regions likely to benefit from these grants and submit them to the Commission. For 1989-93, the structural funds budget amounts to ECU61 billion (427 billion French francs [Fr]), of which 10 percent is for initiatives. The remaining 90 percent is divided by the "Community Support Frames" among the member states which use the money according to their regional priorities.

The essential feature of these initiatives is that they require expenditure to be focused on priority areas.

Within the STRIDE program, ECU400 million (Fr2.8 billion) should be allocated to the least developed regions with the specific objective of strengthening their technological capacity. In practice, STRIDE pursues three objectives through three subprograms, which proposals from member states should seek to satisfy:

- To strengthen the potential for fundamental research and technological development;
- To help the regions maximize their involvement in Community research programs;
- To encourage cooperation between research organizations and industry.

Thomson's Duffin on Need for European Semiconductor Industry

92WS0689A Munich ELEKTRONIK in German, 23 Jun 92 pp 60-62

[Article by Murray Duffin, Vice President for Service and Quality, SGS Thomson Microelectronics, Agrate] [Text] Europe and the Semiconductor Industry—or why a failure in the semiconductor sector is no alternative.

The semiconductor industry is the engine of economic growth and independence vis-a-vis other major economic powers. Japan recognized this fact early on. Europe, on the other hand, is maneuvering itself into an offside position in this sector.

In recent times there has been an intensive dialogue between the important companies, the ministries of individual governments, and the EC regarding the European semiconductor industry. Although this growing awareness can be described as encouraging, it is by no means clear whether the real strategic importance of semiconductors has as yet been regognized.

Semiconductors are of absolutely fundamental importance. They represent nothing else than the profitable manifestation of what is the last of the only three fundamental discoveries which man has made during his entire history until now. This fact is worth visualizing (see table).

This strategic importance has more than one aspect. We tend to look at the basic discoveries which are presented in the table, and the revolutions which they brought about, only with regard to their material advantages, and thus to ignore their social consequences. Fire and agriculture transformed nomadic hunters and gatherers into inhabitants of permanent settlements. The ability to smelt metals and the first industrial revolution resulted in the formation of national states and in global development. They also led to a situation where wars became destructive to an unacceptable degree. The revolution in the field of computers and communications, in turn, formed the basis for the political upheavals in the totalitarian states which we have witnessed in the last two years.

The possibility of a military conflict develops when—whether intentionally or not—major mutual misunderstandings exist and secrecy is maintained. Computers, communications, and satellites—in other words electronics—can help to obviate misunderstandings in that they make the opportunity for secrecy almost impossible.

These three technologies therefore have the potential to make major military conflicts obsolete. However if they are not prudently used they also bring with them the possibility of causing unacceptable competitive advantages in the economic sphere, which result in trade wars or—worse yet—the loss of economic independence.

Several years ago Pasquale Pistorio, Chief Executive Officer of SGS Thomson Microelectronics, recognized that no highly developed industrial society can exist without controlled access to a highly developed electronics industry. The latter, in turn, cannot exist without controlled access to a highly developed microelectronics industry. In this context the emphasis should be placed on the concept "controlled."

The semiconductor industry is not only a base technology with fundamental importance for our economic and social well-being, but also should be described as unique with regard to four additional important strategic aspects:

1. No sensible alternatives or substitute technologies exist for semiconductor technology. The only alternative sources of supply are at the same time our greatest commercial rivals. By this I, of course, mean the United States and Japan, as the other two highly developed national economies. Were we to lose our independence in the field of semiconductors, we would be not only economically exploitable, but also dependent to the greatest degree on one or two other nations.

As far as the Americans are concerned, we can set our minds at rest, for to them the rules of the game are by and large the same as ours. The Japanese are another matter—they place more importance on profit or loss than on solutions which are of benefit to all. They are always ready to help us pull the carpet out from under ourselves.

2. Semiconductor technology has an enormous influence on the independence, the economic situation, as well as on the prestige of a country. The semiconductor portion of electronic equipment at the present time makes up on the average only 7 percent of the final sales price (Figure 2). How great, however, is the influence of electronics on almost all other branches of industry? Every ECU which is spent for independence in the semiconductor field is multiplied a hundred times in its effect, and affects our entire economy accordingly. No other industry is of comparable importance. The Japanese recognized this fact already 15 years ago; the VLSI initiative was aimed not at dominance in the semiconductor field, but at dominance in computers.

3. The potential demand for semiconductors is still a long way from being satisfied (Figure 2). In the United States electronics has already advanced to being the largest branch of industry, and is still growing three times as fast as the gross national product. In Europe the per capita semiconductor consumption of the population is only half as large as that of the U.S. There exists no other comparable driving force for economic growth. Shall we really allow this driving force to fall into the hands of our economic competitors?

3. No other industry in previous history has ever been as contra-inflationary as the field of semiconductors. Between 1974 and 1994 the per-bit price of non-temporary memories will have decreased by a factor of 15,000! The idea that an automobile which costs ECU15,000 would be offered 20 years hence for ECU1 (after taking inflation into account), and that this ECU1 automobile would be faster, safer, easier to maintain, and could be manufactured with less expenditure of materials, is simply inconceivable and with a certainty also impossible. In the end result, however, the reduction of production costs in all branches of industry depends on semiconductors. If we are not in a position to compete in this field then we would naturally have to accept the monopolistic prices of foreign suppliers, together with all the troubles which result from this.

It is not for me to give advice to our industrial, economic, and political decision-makers. However they should not wait too long to find their answers. The game can be lost more quickly than one would think. Without IBM—(an American company, mind you)—Europe would already be out of business in the DRAM field.

Why must something be done? Because Europe is not a competitive environment. For various good reasons, and possibly also for a number of not so good ones, we have allowed the scales to be tipped in favor of our adversary. It should not be forgotten—we are the ones who did it, not the others.

There are three structural problems which are responsible for this:

1. The historically conditioned economic and political fragmentation of Europe, and the inflexibility of the efforts to remedy this.

2. Expensive money and difficult access to capital.

3. The high cost of wages and the annual working time of only 1,600 hours, (compared to 2,000 hours in the United States and in Japan).

In a branch of industry which requires large amounts of capital and money, like the semiconductor field, good management is not enough to eliminate these handicaps. (Although improved management is of course still a prerequisite for any attempt at a solution.)

There is still another important point. The entry costs and capital costs for further technological development are so high that they can only be raised by the most prosperous firms. Even the Japanese Keiretsu in its VLSI initiative had to rely on mergers and government assistance. Apart from this the Japanese suppliers can count on a substantially larger internal market (inside of Keiretsu) than we can in Europe. For this reason programs like ESPRIT or JESSI are indispensable, even though for the reasons above-mentioned they are by no means sufficient.

The answer lies not so much in aid for research and development as in the cooperative ventures which we have just mentioned. Flexibility and productivity are also factors which are worth considering.

Agricultural subsidies and commercial air traffic are much more expensive, but of considerably less strategic importance than semiconductors. Europe therefore can very well afford the necessary measures. The question is whether Europe will allow itself these measures, and whether they are implemented in time. Under no circumstances can Europe afford to remain inactive.

FRG's Riesenhuber on JESSI, European Chip Industry

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[Text] Microelectronics has strategic importance for the competitiveness of German and European industry. Europe's share in worldwide electronics production, however, has been on the decline since 1980. ELEKTRONIK spoke with Federal Research Minister Dr. Heinz Riesenhuber about the problems of European microelectronics and about the JESSI research program.

ELEKTRONIK: Minister Riesenhuber, if one looks realistically at the European microelectronics scene, one can only come to one conclusion: Europe has missed the boat. Catching up with or even overtaking Japan is as good as impossible, especially since every second chip is by now being produced in Japan.

Riesenhuber: This theory is not tenable. Today from a technological viewpoint Europe is in a position to produce all important microelectronic chips. In spite of this, European chip manufacturers are only in 10th place as compared to the rest of the world. And in fact it can't be a question of overtaking Japan. The strategic challenge for microelectronics in Europe lies much more in maintaining and building up Europe as a microchip production site for the future. We must find independent solutions, which are tailored to our industrial structure. To this purpose efforts are being mobilized in Europe at the present time.

ELEKTRONIK: You have said yourself that Europe through her own efforts can't fully cover the whole range of tasks which are relevant to microelectronics. For this reason JESSI is now concentrating on user-specific ICs. That is certainly narrowing it down in the extreme!

Riesenhuber: Surely there can be no question of "narrowing it down"! No one has said that JESSI is the sole solution for the microelectronics problems of Europe. JESSI is a research program with the aim of focusing the resources for research and development which are available in Europe, and bringing them to bear on strategic goals. JESSI differs from the broadly designed research programs of the EC, ESPRIT for example, in two respects. In the first place JESSI, as a EUREKA program, is organized by industry itself. In the second place, in JESSI an attempt will be made to concentrate the research and development activities on a few focal points.

JESSI concentrates not on one, but in fact on three focal points—technology, production equipment and materials, and user-specific circuits. The fact that the industry has placed one focal point in the field of ASICS [application-specific integrated circuits], seems to me plausible and strategically correct; in all branches of industry which rely on the use of chips—from machine consrtruction and automobile consruction into the medium-sized range—the system know-how is concentrated on user-specific chips. If a European system manufacturer could obtain these chips only from his Japanese competitor, a dangerous dependency would be the result. Here lies the strategic challenge for European microelectronics.

ELEKTRONIK: The figures recently published by the VDE, according to which the ratio of standard to user-specific ICs is now at 1.6:1, and is predicted to be at 1:1 by the year 2000, are totally out of touch with reality. In actual fact this year user-specific ICs are estimated as making up only 7.4 percent of the total German consumption of semiconductors. The new JESSI concept, with its concentration on ASICS, is therefore more or less a farce!

Riesenhuber: Quite regardless of what percentage of ASICS is being predicted for 2000, one thing is indisputable: The use of ASICS is having a growing influence on the competitiveness of our industry. That is why the users of microelectronics have a many-sided interest in JESSI. In addition to the large-scale users in the fields of automobile construction, communications, and entertainment electronics, medium-scale industry is also looking for increased access to user-specific system solutions. The conversion of complex technical system solutions into products has only become possible through advances in microelectronics. Thus in consumer electronics the development of a series of highly complex integrated circuits for high-resolution television (HDTV) requires the use of the most modern microelectronics technology. Because of the large number of units which are required in the field of consumer electronics, the mass market which stands behind HDTV will generate an enormous demand for circuits.

ELEKTRONIK: One thing is certain in any case. Criticism of this billion-mark project, even from those who were formerly in favor of JESSI, is increasing. Even industrial associations, such as for example the Federal Association of German Industry, have only small hopes for this program—otherwise they would not have now have become increasingly active in matters of electronics. The whole thing can be summed up in one sentence: The European, and more particularly the German research and support policy for microelectronics has failed!

At the time of the two Hannover trade fairs intensive discussions went on concerning a production site for the 64-megabit memory. A decision has still not been taken—one of the main reasons being that Siemens and IBM are waiting on financial aid for the project from the government. Opinions about this can be very divided. On the other hand the Italian government ater all subsidized the construction of the chip factory of Texas Instruments in Avezzano with a billion marks. Why should that not be possible here, for example in the former microelectronics center of Dresden?

Riesenhuber: In discussing microelectronics two aspects of the matter should be distinguished—the aspect of

Europe as a research site for chips, and that of Europe as a production site for them. JESSI is a program for the improvement of Europe as a research site. Only when we strengthen Europe as a research site, will we create a realistic chance of securing Europe as a production site as well.

Research is an indispensable prerequisite for later production. But even large investments in research still don't automatically lead to industrial production. While for securing the research and development base the government is called on, a concept for production can only be developed by industry.

It is not the research and technology policy which has failed. On the contrary, with regard to research we are on exactly the same level as Japan! What does not yet exist is a common strategy on the part of European industry. There lies the still unresolved central problem of microelectronics in Europe.

This is why, together with my colleague Moelleman, I have seized the initiative and have created a work group whose aim is to submit to the government the ideas of industry regarding chip production. The securing of Europe as a production site concerns not only the chip manufacturers, but above all the major chip users. For this reason they are included into the above-mentioned microelectronics work group.

The question as to whether the government, in addition to supporting research and technology, should also support the construction of chip factories, can only be rationally discussed once the industrial concept for this has been proposed. Here we should rule out nothing in advance.

ELEKTRONIK: In accord with the new concept, as you yourself have written, technology development will be discontinued in JESSI for the time being, since the firms of Siemens and IBM are attending to this with the 64-megabit DRAM. What will happen after this though, since Japanese firms like Hitachi, Mitsubishi, as well as NEC, together want to invest billions of marks in further development—to include the gigabit chip by the year 2000? Is there any guarantee that IBM and Siemens will continue their development of conductor and process technology?

Riesenhuber: There can be absolutely no question of no technology development being carried out in JESSI! The development of technology by JESSI is in fact one of the components of JESSI support in Germany. This is one of the crucial focal points of the program, and also the field which receives by far the greatest financial support from the EC. However now that the results of memory development in the starting phase of JESSI are being put into the production of 16-megabit DRAMs in the French firm of Corbes-Esonnes, it is not necessary at present in Germany to give special financial support to DRAM developmental work, since this continuing developmental work is presently being carried on by Siemens in the U.S.

In the case of the billion-mark expenditures by Japanese firms to which you have referred, you should be careful to distinguish between research and devlopmental work on the one hand and necessary production decisions on the other. Two totally different financial scales are involved here. The JESSI program devotes itself to the research and development tasks of microelectronics. Investments in production facilities are free decisions on the part of businesses, and should not be influenced by a research ministry.

ELEKTRONIK: On the subject of money. Even the president of the Fraunhofer Societies, Max Syrbe, has said, according to *Wirtschaftswoche*, that the level of effectiveness of the JESSI funds is deplorable. Others speak of a "self-service store." In this year, after all, DM875 million are to be spent on so-called flagship projects and the sub-programs belonging to them. That's rather a considerable amount per project!

Riesenhuber: From the amount of the sum which you have mentioned you can infer with what determination Europe has taken up the challenges of microelectronics! The participating companies are showing that they all consider the path taken by the JESSI program to be the correct one simply by the fact that they themselves are raising one-half of the DM875 million. The choice of projects which has been made by industry itself, and concentration on individual focal points are certainly the best guarantee for the optimal conversion of JESSI's successes. When you compare figures you must take into account the fact that JESSI presently consists of 55 projects, which are tied together in clusters. A flagship project stands at the head of each of these clusters.

The Federal Ministry of Research and Technology spends about DM110 million on JESSI annually. In view of the importance of the matter this seems to me rather modest.

ELEKTRONIK: The credibility of JESSI suffers from the fact that rather a lot of petty secrecy is being carried on, because the management of each project belongs to an industrial firm. However since the tax-payers are after all contributing 50 percent towards each project, the general public has a right to learn what is actually going on.

Riesenhuber: I have told the responsible industrial managers in JESSI quite clearly that public relations work must be improved. The project is now in the first year of its main phase, which is structured for six years, so that I hope that this problem will shortly be solved.

Naturally the situation of worldwide competition compells us not to reveal details of developmental work to competitors too early. On the other hand the federal government is just now making an effort to give an extensive explanation of JESSI's progress. In the first three months of this year alone the Federal Ministry of Research and Technology has issued three press statements as well as two detailed brochures, which are devoted solely to the subject of JESSI. Also the stand of

the Federal Ministry of Research and Technology at the Hannover Industrial Trade Fair has given out detailed information on JESSI, including a podium discussion among other things. At the CeBIT the JESSI organization has also published its own brochure.

ELEKTRONIK: You recently wrote that the "arranged joint production of 16-megabit memories by Siemens and IBM secures for the long term European know-how in the production of highly integrated components, and thereby ensures European independence." This statement, however, seems to us very doubtful. In the first place IBM manufactures only for its own needs, and secondly, a Siemens firm can hardly achieve anything against the multitude of Japanese firms, not to mention Korea. If Europe wants to be truly independent, a number of enterprises must always be in a position to manufacture chips of this category.

Flagship Projects Included within the JESSI Program

Project Name	Participants
Ultra Large-Scale Integration of a Control Unit for a Safety Critical System (Distance Radar)	Bosch, STM, Uni Hannover, Siemens, Alcatel SEL, Alcatel CIT
Advanced VLSI Components for B-ISDN ATM Networks (Wide-Band IC)	Alcatel Bell, SDM, STM, Alcatel SEL, Alcatel CIT
Advanced VLSI Chip Set for ISDN Videophones (ISDN Videophone)	PKI, MHS, Matra Communications, Daimler-Benz/Dornier, Siemens, Jydsk Telephon
Implementation of Prototype Building Blocks for a DAB Standard (Digital Radio)	Philips, FhG-AIS, AEG, Telefunken, Bosch-Blaupunkt, Thomson CE, CCITT, STM, Grundig, IRT
Europroject HDTV (HDTV Chip)	Philips, STM, Siemens, Thomson CE, TU Eindhoven
Advanced VLSI Components for the GSM Pan-European Digital Cellular Radio System (Mobile Radiotelephone Chips)	Alcatel Bell, STM, Alcatel ACR, Uni Leuven
Advanced Technology for Volume Production	STM
Joint Logic Project	Philips, Siemens, STM, Plessey, MHS, Mietec, ES2, TEG
Ultra Pure Wet Chemicals and Supply Systems for Semiconductor Processing	Merck, Riedel-de-Haen, LETI, Siemens, FhG-AIS, STM, Philips, Gemetec
Gases Technology, Ultra Clean Technology in Gases and Chemicals for ULSI	Linde, Messer Griesheim, Air Liquide, LETI, MHS, Comurhex, FhG-AIS, STM, Siemens
Integrated Vacuum Processing System, IVPS	ASM-AMTC, Electrotech, Leybold, AST, Plasmos, Cybernetics, FhG, Philips, Siemens, IBM
I-Line Production Lithogtraphy for 0.5-Micron ICs	ASM-Lithography, Carl Zeiss, Siemens, STM, Philips, Hoechst, UCB
Automated Mixer VLSI Tester	Schlumberger, Uni Sussex, STM, CNET, Siemens
Flexible Automated Wafer Production	TEG, Plessey, MHS

Riesenhuber: You are proceeding from the mistaken opinion that memory components are the elixir of survival for the European electronics industry! They secure a production know-how, on which we in Europe must then touch down with ASICs. To be more precise—through the joint production of 16-megabit memories by IBM and Siemens we will be put into a position in Europe where we can even produce "higher-quality" system components in 0.5-/gmm structures. The microelectronics strategy in Europe cannot come down to a chip autarchy. We are counting on international competition. However we see the danger that Europe could become dependent on a Japanese monopoly. For this reason we must secure a fall-back position for ourselves.

ELEKTRONIK: In your ministry, when it's a question of support, technology development which is related to pure research has already for some years received the main attention. This seems to me today, however, to be no longer really the point which must be addressed—also the Fraunhofer institutes serve this purpose. Even the president of Siemens, Karlheinz Kaske, said that enough pure science is already available in Europe, and that the sticking point is its translation into practice. We share this viewpoint. Could this dilemma be solved through another type of support policy?

Riesenhuber: The primary task of a policy for research and technology is to secure Germany as a research site. During the past we have managed to build up a good base in the field of pure research. This took place in the form of a bid for innovative capacity in industry. JESSI is really a prime example of a close link between research and practice. Through the structure of the project, whereby in each case an industrial partner acts as manager, it is guaranteed that the results achieved by the participating research institutions are directly incorporated into the products being developed by industry. It had been my wish that the infrastructure from research would be still more fully utilized here.

ELEKTRONIK: In a successful conversion of technological discoveries into real products it is also important that chip production be conducted on a large scale. However, in Europe and also in Germany small-scale production is more typical. Why doesn't the ministry

launch more comprehensive research programs, such as "The Safe Automobile," "The Energy-Efficient House," "The Cross-Linked Factory," or "The Interactive TV set," to name a few examples? In this case more businesses would be involved, also medium-sized ones for example, and the end result would be production on a considerablly larger scale.

Riesenhuber: It is completely true that, in addition to the semiconductor memory elements, which are needed in large numbers for the computer industry, a demand impetus from other fields of application must also be generated. Only through large-scale operations can the production of semiconductor elements become economically attractive. This is the basic idea of the various user projects, as they are carried out in JESSI. Among these I would number the above-mentioned HDTV, as well as the digital radio (DAB), the videophone, and the development of fail-safe components for motor vehicle elctronics—in addition to this also safe and environmentally compatible road systems, an application field which is being supported outside of the JESSI program.

ELEKTRONIK: We thank you for the talk, Minister.

Top German Business Leaders Differ on Technology Policy

92WS0711 Munich TOP BUSINESS in German Jun 92 pp 34-44

[Article by Bernhard Adam: "Fight Over Beliefs in the Central Association"]

[Text] Outwardly Heinrich Weiss, president of the Federal Association of German Industries (BDI), appears calm and detached when he speaks publicly on the theme of industrial policy. But among friends the BDI head's relaxed attitude vanished when he discusses this theme nowadays. Then the chairman of the board of SMS Schloemann-Siemag AG can become really annoyed.

There are reasons for that. For a bitter dispute has been raging under the surface in BDI for months about the course which the enterprising central association should follow on economic policy. For one of the four big names in BDI, the Central Association of Electrotechnical Industries (ZVEI), is sounding the charge against a pure market economy and is demanding a far-reaching industrial policy. If ZVEI has its way, it would mean a 180° turn from previous BDI policy and would split the association, which is steeped in tradition, into two irreconcilable camps. At the same time, such a change of course would significantly strengthen the group of industrial policy advocates in Bonn, and especially in the EC Commission in Brussels.

What the industrial policy men have in mind was formulated quite openly by the designated chairman of the board at Siemens AG, Heinrich von Peter, at the speech commemorating the 100th anniversary of the founding of the company in Frankfurt: "It is necessary to rethink the principle of liberalism and a free economy when dealing with the development of microelectronics in Germany."

Alfred E. Esslinger, managing director of IBM and president of the professional organization for information technology in VDMA and ZVEI, is sounding the same note. "Where not very attractive underlying conditions combine with global competition and turn into a giant risk for the company, government help in the interests of the nation's economy as a whole is necessary," Esslinger explained during a podium discussion at the Hannover trade fair CeBIT.

Such sentiments send chills down the spines of the keepers of the privy seal of the free market economy both in the federal government in Bonn and in the BDI head office at Cologne. The BDI association leaders in particular have been caught unawares by the massive initiative of the ZVEI and its organized business members. For until now a subject like industrial policy represented no more than an academic problem for Germany's central industrial association, a matter which is preoccupying France in an alarming way, which German socialists dream of, but for heaven's sake, not for established, economic leaders of the Federal Republic of Germany.

But already years ago German businessmen and politicians raised warning fingers and, with the background of the Japanese challenge, called for more coordination and planning in economic policy.

One of the first to demand an industrial policy which would be coordinated by a central division, for example in the office of the Federal Chancellor, was AEG head Heinz Duerr, currently president of the Federal Railway.

Finally, last year Hans-Dietrich Genscher's chief planner, Konrad Seitz, heated up the discussion considerably about the pros and cons of an industrial policy in German economic circles with his highly-regarded book, "The Japanese-American Challenge."

In it, Seitz, who has since been transferred to Rome as ambassador at the instigation of liberal party chairman Otto Graf Lambsdorff, revealed a gloomy scenario. "Europe is in the process of losing its semiconductor, computer, and entertainment electronics companies." And once these key areas have been broken off, he said, it would only be a question of when German or European industry would also have to leave the fields in which it is still strong: transmittal and information systems in telecommunications, industrial automatization, automotive and medical electronics. Europe in the year 2000, in his view, will be without its own companies in information technology. He said that the danger exists of the continent turning into a technological colony in which Europeans only provide workers and middle management for Japanese factories.

According to Seitz, it is too much to ask the market to correct the development by itself. He says that long-term industrial policy strategies are necessary.

Not only words were involved. The EC Commission in Brussels, which is increasingly determining economic life in Europe, is gearing up for action. Under the direction of Filippo Maria Pandolfi, commissioner for research and development for the telecommunications and information industries, it has developed plans of action for the European electronics and information industries. In them Pandolfi stresses the absolute necessity for independent European production of semiconductors. More intensive trade, the increased interdependence of national economies and shorter product introduction times made access to the technologies and the newest components a prerequisite for competitiveness. "This is particularly true for components which must be available for the companies in sufficient quantities so that they can continue to introduce innovative products to the market," the EC program states. This would mean that Community industry can lessen the danger of supply difficulties, particularly in the area of microelectronics, if it develops the requisite products itself.

And this Community matter is the starting point for the representatives of the German electronics industry. "If Brussels or Bonn issues orders that semiconductor production must remain in Europe for higher political reasons, then the politicians must also make sure that the risks of production are tolerable for the companies," says Dr. Franz Josef Wissing, chief managing director of ZVEI.

The dispute was kindled by the immediate question of the status of the Community factory of IBM and Siemens for the production of the next generation of semiconductors, the 64-megabit chip. Europe's position, not to mention Germany's, was too unfavorable for the cost-intensive manufacture, in the estimation of IBM's managing director Hans-Olaf Henkel and Alfred E. Esslinger, and Siemens's board members, Karlheinz Kaske, Heinrich von Pierer and Juergen Knorr, who are responsible for semiconductor technology. Merely building the factory would cost more than DM5 billion. And in addition there would be the horrifying costs of running it.

Thus if the two businesses had to finance the production of the 64-megabit chip on their own, Henkel claims that it would be tempting to do this at IBM's original home in the U.S. Now the low-wage country of Singapore is also being discussed.

For both IBM and Siemens, Germany as the location of the Community project is only discussable if the circle of those financing it is made larger. One possibility is a conglomerate of several companies, among which there could certainly be product users. But another possibility is state subsidies, although according to Wissing, managing director of ZVEI, they should cover a limited time period.

But if there is no help coming from third parties, IBM head Henkel sees a black picture for Europe's microelectronics. "If we miss a technological step now, the production of storage chips in Europe is gone forever." According to Henkel, the loss would be irreversible, for in this technology you cannot simply leave out a generation now and again. In addition, it would mean that important parts of the JESSI project would have been pointless. For one of the goals of JESSI is to rebuild the infrastructure for chip production which has already been lost to the Japanese, as Henkel emphasizes.

In order to increase the political pressure, the representatives of the electronics industry—Wissing, Kaske, von Pierer and Henkel—are now trying to win the central association of the German economy, the BDI, over to their ideas. That has meant the end of peace and quiet for the BDI.

Heinrich Weiss, and his chief managing director, Ludolf von Wartenberg, are afraid that the BDI's basic market economy positions could be eroded by such concessions to industrial policy, and the whole association could lose its credibility. According to Dr. Hans-Joachim Hass, division chief for research, technology and structural policy in the BDI, the main task of his association should still be to stand up for an improvement in site conditions, for a reform of business taxes, a decrease in burdens and regulations. But it is certainly not the task of the central industrial association to work to the advantage of one industry.

The same line is followed in particular by the Assocation of Chemical Industry (VCI) and its president, Professor Wolfgang Hilger, chairman of the board of Hoechst AG, and his colleagues from Gesamttextil under the leadership of Wolf Dieter Kruse. The managers from the chemical industry counter the ZVEI representatives by saying that they had always gotten by without state support and had nevertheless achieved leading international status and even gained a foothold in Japan. And Textil's leader, Kruse, warns: "Demands for greater participation by the state in industrial development are being heard, with reference to the competition with Japan which is overwhelming in some areas. Gesamttextil sees a danger in this for the principles of a market economy with which German industry has managed very well in the past."

And Kruse has this message for the representatives of the electronics industry: "The textile industry has demonstrated over the last few decades that German businesses are in a position to assert themselves in the marketplace in spite of the toughest international competition without state support, even if this process has been linked with a reduction in the size of the industry over a period of many years."

But the ZVEI representatives will not grant the validity of such arguments. If no textiles were being produced in Germany or Europe anymore, that would certainly be

hard on the industry, but it would not mean that Europeans would be running around naked, because they could be supplied without difficulty by third countries. But by halting chip shipments, the Japanese could paralyze almost the entire European economy.

The "market economists" in the BDI also acknowledge the importance of semiconductor production for the economy. Nevertheless, they firmly reject the idea of an industrial policy for the electronics industry. For the leaders of the BDI guess, probably rightly, that state support for 64-megabit production would not be the end of it, but that subsidies would then be established for the long term. They also fear creating a dangerous precedent. "If we allow the electronics companies to do this, then tomorrow the automotive industry will be standing at the door and demanding protection and support in the face of Japanese competition," as Hass describes the problem.

But above all, an about-face for the powerful BDI, which enjoys considerable influence in UNICE, the association of European businessmen in Brussels, would significantly strengthen the industrial policy wing in Bonn and particularly in Brussels. Thus Klaus Wolf, chairman of the board of the trade association for electronic components in Nuremberg, has already noted with satisfaction: "The weights in the two major popular parties, CDU/CSU and the SPD, are gradually shifting over to our point of view."

Dr. Werner Gries, undersecretary in the Ministry for Research and one of the leaders of the interministerial working group which is to develop a presentation on this problem for the federal government, represents the opinion that microelectronics possess a fundamentally different character from any other branch of industry. That is why in his opinion subsidies and protections measures are permitted in order to maintain the position of Germany and of Europe.

Gries will meet with no opposition to his views from the French government of prime minister and head of government Pierre Beregovoy or from Pandolfi, the commissioner at Brussels, or from Commission president Jacques Delors himself, who plans to spend significantly more money than before in future for company research with immediate market application.

In addition, the EC treaties of Maastricht contain a separate chapter on industrial policy. It states that the Commission can specially support one or two industries at the request of a member state or even in certain cases set up protectionist trade barriers (Article 115) if certain industries are externally threatened. But on the other hand—and the Helmut Kohl government and internal market commissioner Martin Bangemann stood up for this during the negotiations last December—a veto by a single country can have such a request thrown out.

At that time Germans and Britons were regarded as a bastion against excessive demands for an industrial policy. But according to Dr. Kurt Fleckenstein, divisonal director for structural policy with the German Conference of Industry and Trade (DIHT), that could change if the central association of German industry takes up a line which is broadly in favor of industrial policy and thus undermines the position of the "market economists" in the federal government.

The Britons too are considered unreliable allies for the future, since with elections to the House of Commons a definite interventionist, Michael Heseltine, is heading the Ministry of Trade and Industry.

But apart from that, according to Heribert Juchems, managing director of the Working Association of Independent Businesses (ASU) in Bonn, the trend in Brussels is increasinly and probably irreversibly towards majority decision and away from the veto power of a single state. He says that this has become apparent in numerous other areas and the same thing will happen in industrial policy.

"Then the industrial policy men of the southern member countries, led by France, will get the upper hand," Juchems fears. The former French head of government, Edith Cresson, who worked intensively during her term of office for a European industrial policy, might celebrate a belated triumph.

Captions

p. 34: PRO: IBM managing director Hans-Olaf Henkel (l.) and the designated head of Siemens, Heinrich von Pierer, no longer want to bear the billion-mark cost of chip production alone. They demand that user firms should also participate in financing, and the state must give subsidies.

CON: Gesamttextil chairman Wolf Dieter Kruse (l.) and chemical association president Wolfgang Hilger advocate a strict market economy policy; both argue that the branches of industry have achieved top international status even without massive state support.

p. 35: QUO VADIS? BDI boss Heinrich Weiss is between the battle lines. For in the central association for the German economy a bitter dispute is currently raging between supporters of industrial policy and traditional market economists.

p. 36: EC Commissioner Filippo Maria Pandolfi has drawn up a proposal for how Europe's microelectronics can compete with Japan.

Edith Cresson, who recently stepped down as head of government in France, is hoping for a belated triumph...

...because President Francois Mitterrand definitely wants to protect the key technology of microelectronics.

p. 37: EC internal market commissioner Martin Bangemann advocates a veto right against protectionist trade barriers. The British minister of trade, Michael Heseltine, is known as a convinced interventionist.

p. 40, top: Former AEG manager and current head of the Bundesbahn Heinz Juerr was one of the first to demand a kind of MITI in Germany.

p. 40, bottom: Economic minister Juergen Moellemann: Is it possible to reconcile laissez-faire and assuring standing through industrial policy?

p. 42: Jacques Delors, president of the EC Commission in Brussels, hopes to spend significantly more money in future particularly for company research with immediate market applicability.

EC Launches Ouverture Operating Systems Project

92WS0713A Paris ROBOTS in French 10 Jul 92 p 1

[Text] The European Commission has just given a big boost to operating systems technology with its launch of the Ouverture project in the ESPRIT program. Ouverture will be funded by the EC and a consortium of manufacturers (Alcatel Alsthom, Olivetti, SGS-Thomson, Siemens Nixdorf) and suppliers of operating systems technology (Chorus, Unix Systems, Laboratories Europe). The launch of Ouverture is an important step in Europe's efforts to insure the competitiveness of its information technology and industry. Unix International is participating in the project, and will work with the others to define the new features of its Unix System V and associated technologies. Ouverture will combine the best-performing technologies from America and Europe to rapidly and inexpensively enhance the state-of-the-art in operating systems, notably by upgrading the Chorus/Mix micro-nucleus architecture. The project will integrate the best of those technologies into the Unix System V Version 4 (SVR4) open systems standard. "Ouverture will target the UNIX market and the rapidly growing markets for on-board real-time and high-performance parallel computing," says Jean Marie Cadiou, director of the ESPRIT program. "The project is important to the EC's Open Microprocessor Initiative (OMI), which is meant to improve both on-board real-time systems and data-processing systems. It is also expected to play a significant role in the field of High Performance Computing (HPC) in ESPRIT III." Ouverture is an essential component of the ESPRIT III program, which will invest $3 billion to develop Europe's information technologies for the nineties. The process for selecting projects after publication of the bid invitation was stringent: One of the main criteria was that the participants provide concrete proof that they would be involved in the actual application and marketing of the project's results. Unix International (Graham Wilson, Scott Hansen) - Ave. de Beaulieu 25, B-1160 Brussels, Belgium. Phone: 32.2.672.37.00. Chorus Systemes Co. (Michel Gien) - 6 avenue Gustave Eiffel, 78182 Saint Quentin en Yvelines cedex. Phone: (1) 30.64.82.00.

French Assess Need for Strategic Information in Analyzing International High-Tech Competitiveness

92WS0723A Paris LE MONDE in French 21 Jul 92 pp 21, 23

[Article by Bertrand Le Gendre: "The Technology Lookouts"; first two paragraphs are LE MONDE introduction]

[Text] French enterprises are discovering the new nerve center of war: strategic information. Well after Japanese or American firms, many of them are now getting into the business of "competitive intelligence." This practice, which is too often confused with industrial espionnage, simply consists of monitoring as closely as possible what direction markets, techniques, and the competition are moving in. The experts are categorical in their opinion that the vast majority of vital information is available legally. "Intelligence" is a state of mind, but one that requires organization and support.

French companies are latecomers to "competitive intelligence," that honorable variant of industrial spying. Today information is a decisive factor in competitiveness.

Americans use the term competitive intelligence to describe a company's capacity to unremittingly seek out novel products, fresh know-how, or unexploited markets. The French have adopted the expression "technology watch," but the idea is the same. It reflects a common, everyday fact that is often underestimated: namely that, from now on, salvation for companies lies less in the industry and business than in information. Information in this case means continuous, meticulous observation of one's environment in the broadest sense—technological, competitive, and commercial.

The job of company "lookout"—the watchman of modern times—is in vogue. It was given a boost by Japan's example (see boxed material) at a time when the most watchful French companies were becoming aware that they had fallen behind. That is what happened at Ciments francais, where Bruno Martinet hired on a year and a half ago as the director of information and training for the Industrial and Technical Research Center (Technodes). Put simply, he is the "lookout man" for the group, which employs 20,000 people in 15 countries. Ciments francais had formerly practiced competitive intelligence "in a fairly makeshift fashion." Assigned to "organize the function," Bruno Martinet first strove to pinpoint the company's strengths in the area. It had some. "Extremely good use was being made of documentary sources, except for those from certain geographical areas such as Japan." But the company's weaknesses were apparent nonetheless. "The size of the group doubled between 1988 and 1990. Circulation of information did not keep pace. Linguistic obstacles were significant: Eight different languages are spoken in the company. Psychosociological obstacles were just as great. At

Ciments francais, as everywhere, information is power, which means that 'technology watch' was often reserved to a privileged elite."

Bruno Martinet set about persuading every engineer and every employee of Ciments francais that "competitive intelligence is everyone's business."

Mobilization

In concrete terms, he strove to take advantage of information sources. Ciments francais commissioned specific studies on what was being done in Japan in the field of construction materials. A delegation was sent to visit that country. Personal relations were cultivated in some American universities for the same purpose. A close watch was kept on new patents. Above all, Bruno Martinet sought to improve the circulation of technical information within the group. A bilingual review was started, as was another devoted exclusively to patents. The number of internal conferences was stepped up, on the premise—proven many times over elsewhere—that information valuable to one part of the company might be close at hand in another department.

Mobilizing the knowledge of each employee to benefit everyone has driven the thinking of the French in the five or so years since competitive intelligence has achieved recognition. "Some organizations, which are dominated by local needs and concerns, are not suited to competitive intelligence," comments Michel Berry, the former director of the Polytechnical School's Center for Management Research. "They are deaf-minded institutions, where information does not circulate well."

Dilemma

Moreover, French bosses hesitate to get involved in what they confuse a bit hastily with espionnage a la James Bond. Few of them manage to convince themselves that 90 percent of the information useful to a company can, as all the specialists will tell you, be obtained legally. There are many channels a company can draw on, including patents, scientific articles, industry shows, the specialized press, and data banks. The hard part is spotting the pertinent information, sorting through it, and interpreting it correctly.

Many companies are trying to resolve the dilemma that lies in wait for recent converts to competitive intelligence: Is the job everyone's business, but assigned to a few? Should there be one lookout, or many scouts? Generally, reasonably-sized companies try to combine the two approaches.

Some turn readily to outside consulting services that specialize in "technology watch." Innovation 128, which its current CEO, Louis Chalanset, founded 12 years ago in Paris, acts as a lookout for Lafuma, the leading French backpack company. It provides Lafuma with a summary of information on its competitors, the state of the market, and technological innovations each quarter. "Lafuma's development of a revolutionary backpack," remarks Louis Chalanset, "is an outcome of our collaboration."

The CEO of Inforama (Paris), a former "second bureau" or intelligence officer, Robert Guillaumot, is also selling "competitive intelligence." He specializes in information science, telecommunications, and electronics. "We function a bit like mercenaries for the big French groups, which ask us to serve as forward posts anywhere in the world where something that threatens or could be useful to them is going on." And he likens Inforama's activities to "those of the Security Council, which helps the American president make the right decision at the right time."

For smaller companies that cannot afford the help of specialists like those at Inforama or Innovation 128, there are subsidized organizations called ARISTs, or Regional Agencies for Scientific and Technical Information. They are housed in regional chambers of commerce and industry. The ARISTs of Alsace and Brittany are often cited as examples. The director the Brittany Agency, Patrick Noel, explains that "openmindedness" is what makes a small boss a model "lookout." A client of Brittany's ARIST, Joel Rochard, the director of AIV & Company in Fougeres (Ille-et-Vilaine), is one of such caliber. The company's 122 employees make window glass, and know that they must rely on themselves, and not on the faraway logistics of the giant American firm, Pittsburgh Plate Glass, to which they belong.

Joel Rochard admits to having had a narrow escape five years ago when a resin that was vital to AIV and made in the Federal Republic of Germany suddenly disappeared from the market. "We were light-years behind on the information we needed." The monitoring that ARIST has been doing since on AIV's behalf encouraged the company to start manufacturing acoustic insulation—with some success. ARIST's help is especially precious to Joel Rochard inasmuch as "our size prevents us from keeping an eye on our industry full time."

The example of AIV or of Nautix, whose CEO Jean-Yves Langlois employs 25 people in the highly competitive industry of ship furnishings and paint in Guidel (Morbihan), should not foster any illusions. French companies may have realized how far behind they are in "technology watch," but they have not yet closed the gap. There are rare university programs that prepare students for the job. Examples are those—from the masters to the doctoral level—headed at Aix-Marseille University III by a chemist, Henri Dou. Bruno Martinet counted three DEAs (advanced degrees) and 10 DESSs (advanced specialized studies degrees) in France, "all told, 100 diplomas a year that could more or less claim to prepare students to be 'lookouts.' That is not very many."

A Habit

Fortunately, "competitive intelligence" is a well-established habit, a long-standing cultural trait, in some

companies. In L'Oreal's headquarters in Clichy (Hauts-de-Seine), surveillance of the market and of competitors is taken seriously. All employees are told to concern themselves with it, even though some are assigned to it full time. "An executive traveling to London generally thinks to stroll through Harrods or Boots without being told," asserts Gilles Roger, of L'Oreal's international division. "Just to see how our products and those of our competitors are being displayed."

Jean-Jacques Petit, the director of international marketing services for the same group, is presently monitoring the Japanese market systematically. He hopes to one day put an end to a humiliating anomaly for L'Oreal, which has 29,000 employees and 152 establishments around the world. "Japanese companies control 90 percent of cosmetics sales [there]. There must be a way to do something..."

The director of packaging research, Michel Fontaine, remembers noticing the cardboard refill for a tub of detergent at a German supplier's one day. Shrunk to the proper size, a similar refill is now being sold with certain bottles of L'Oreal's "Studio Line" shampoo. The rationale for this ingenious form of packaging is unbeatable: "The refillable, reusable bottle and its ecological refill (made of recycled cardboard and a plastic sack) fosters greater respect for our environment." The foregoing is an excellent example of "competitive intelligence." It is an exercise that too few companies practice spontaneously, without necessarily calling it that or advertising it from the rooftops.

Boxed Material: Japan on the Lookout

The success of Japanese companies is said to be due largely to their ability to secrete the "information" hormone. Technologies that the Japanese cannot buy they acquire by tracking down the information they need by whatever means necessary. That is how, says Jacques Villain[1], they succeeded in building up a space industry despite the refusal of the Americans and Europeans to initiate them into the secrets of the hydrogen engine.

In the Land of the Rising Sun, information is a constant preoccupation that is instilled in everyone. The Japanese are a curious people. They "consume" six times as many daily newspapers as the French, with only twice our population. Keeping informed is a national duty, which is encouraged by the famous Japan External Trade Organization (JETRO). One of JETRO's missions is to gather information from everywhere in the world and to procure the technologies that will ensure the prosperity of Japanese companies. JETRO has 77 overseas offices in 57 countries.

The Japan Information Center of Science and Technology (JICST), an office of the prime ministry, analyzes 11,000 reviews—including 7,000 foreign ones—some 15,000 technical studies, 500 conference reports, and over 50,000 patents each year. Its ant-like industry results in the publication of some 500,000 abstracts for the use of companies, which generally maintain their own information-gathering task forces. At NEC, the information task force keeps 250 people busy. Their work amounts to 3 to 4 percent of the company's employee working time.

Footnotes

1. "The Watchful Company", by Jacques Villain, published by Masson in 1990, in the "New Economic Order" collection.

New Areas of Research in Dresden, Bavaria Discussed

92WS0731A Duesseldorf VDI NACHRICHTEN in German 26 Jun 92 p 21

[Article by mas: "Two New Special Research Areas"]

[Text] The German Research Association (DFG) established two new special research areas on 1 July. For the first time, the University of Dresden becomes an institute of higher learning from the new Lands to receive one of the "most expensive" support instruments that the DFG has to offer. In the end, a perspective of up to 15 years is offered to the scientists.

Automated System Designs will be covered in Dresden. Computer programs are to be developed in a border area between electrotechnology and computer science. With these programs, electronic systems can be designed and optimized during the design phase automatically. To facilitate contacts with the international scientific community for the scientists from Dresden and Ilmenau, the universities of Karlsruhe and Paderborn are also linked in the special research area. This is a unique construct in the history of the support process. After six years, however, the researchers from Dresden will go it alone.

Engineers and materials scientists in the Production Systems in Electronics special research area in Erlangen-Nuremberg are studying potential innovations for joining electronic circuits. More exact knowledge of surface properties of the materials used could result in optimization of the production processes. These materials are becoming more and more important because of the increasing miniaturization of electronic circuits. Other projects will study the fast conversion of new technologies into production.

The number of special research areas supported by the DFG thus has grown to 182. For the old Federal Lands, 400 million German marks [DM] are available for this purpose this year.

[Box, p. 21]

Special Research Areas in Bavaria (Excerpt)

Key: 1. Bayreuth: Material conversion in ecological systems 2. Erlangen: Immunological mechanisms in infections, inflammation, and autoimmunity; Pain syndromes 3. Munich: Genetics of the human immune

response; Neuron systems; Auditory system of vertebrates; Primary processes of bacterial photosynthesis; Transatmospheric flight systems; Information processes in autonomous mobile handling systems 4. Regensburg: Sensory performance 5. Wuerzburg: Genetic expression in vertebrate cells; Plant performance under stress.

CORPORATE ALLIANCES

Prospects, Background of Volvo/Renault Fusion

92WS0655A Munich TOP-BUSINESS in German Jun 92 pp 66-73

[Article by Thomas Luber: "Renault-Volvo: Love Out of Utter Necessity"; first paragraph is TOP-BUSINESS introduction]

[Text] After an alliance of barely two years, the two auto companies Renault and Volvo are on the verge of merger. A show of strength in which the new Renault head Louis Schweitzer will wield the baton.

Chairman Pehr Gyllenhammar of AB Volvo (1991 annual sales: almost 20 billion German marks [DM]) could hardly put his satisfaction into words on 29 April. The alliance with the Regie Nationale de Usines Renault S.A. (annual sales: about DM50 billion) established in September 1990 by him and former Renault leader Raymond H. Levy, has "fulfilled Volvo's dearest dreams," he informed the stockholders at the general meeting of the traditional Swedish company.

Even then, this account no longer corresponded to the actual facts. Because all that had been fulfilled were the long rampant speculations that the alliance of the two automakers would one day lead to a common company; according to a letter from Volvo's board of directors to the members of the managing board, the two companies intend to increase their mutual capital participation this summer. The heads of the two companies are convinced that that is the only way to eliminate the major deficiencies of the partners, i.e., inadequate sales and lack of a global presence.

Gyllenhammar's personal ambitions: To save the autonomy of the traditional Swedish company, which the 57-year-old has governed absolutely since 1970, beyond the year 2000 or to assume leadership in a merger with another company, have fallen by the wayside. If the trial marriage between Renault and Volvo becomes a union for life, the new Renault chairman Louis Schweitzer, selected on 22 May, will have the controlling interest and be top dog; Pehr Gyllenhammar will have to take second place.

Gyllenhammar has thus lost a high-stakes poker game which began on 23 January 1990 when he and Levy publicly announced their planned alliance in Amsterdam. Secured by capital participation, the two companies intended to overcome all future perils of economic life together according to the basic idea of the agreement. "We can survive without having to face the alternative of eating or being eaten," was Gyllenhammar's euphoric comment.

Too Small To Survive

The Volvo chairman had sought such a partnership for years. It had long ago become clear to the crafty strategist that his company lacked the volume to survive as an independent producer of automobiles, commercial vehicles, and aircraft parts. Ever since the mid-1980s, when his attempt to create a biotechnological pillar for Volvo failed miserably with high losses, he had been seeking a suitable partner company.

It was no accident that his selection was Renault. The French national company still held a rather large package of Volvo shares through the mid-1970s; at that time Gyllenhammar also still had friends in France, such as the current president, Francois Mitterand. The offer was convenient for Levy, called to head Renault in 1986. And not just to elude the influence of the government which has been stifling every company initiative.

Renault itself has been seeking a partner since the mid-1980s because the company was getting by as the only European automaker with a single trademark and exclusively from the auto business. Another shortcoming: The French are present, practically speaking, only in central and southern Europe. Levy first flirted with a Japanese partner, but the French government opposed this notion.

High Potential for Synergy

Thus the Renault leader finally agreed to Gyllenhammar's offer, particularly because the product catalog of the two companies does not overlap: In both the car and truck sector, Renault is primarily involved in the lower and middle range whereas Volvo almost exclusively sells upper range cars and heavy trucks. The two complement each other in terms of geography as well: Volvo (major sales territories Scandinavia, Great Britain, U.S.) and Renault (central and southern Europe).

Outwardly, cooperation has been concentrated in three areas:

- Components: In 1991 Renault equipped Volvo with 93,500 diesel units and 82,000 transmissions; Volvo intends to deliver 100,000 series "N" modified gasoline engines per year beginning in 1993. Already, 16,000 panels for the understructure of the "Clio" are supplied each week from the Olofstrom Volvo plant to the assembly lines of the Renault plant in Flins.
- Purchasing: The partners buy approximately 20 percent of their vendor parts jointly to obtain better prices. The twosome have divided up this business: Volvo deals with Robert Bosch GmbH for Renault S.A., Renault with Michelin and Valeo for its Swedish partner.

- Sales and marketing: Wherever reasonable, the national dealer networks are supposed to complement each other. Renault intends to promote the sales in France of the Swedish auto, which have been rather sluggish for a long time; Volvo, its partner Renault in its domestic market of Scandinavia.

However, both partners had more in mind from the very outset than this rather banal form of cooperation. After all, no alliance would have been necessary for this current type of cooperation. In fact, Volvo used to buy its diesel engines from Volkswagen without any plans for entering into a partnership with Wolfsburg, and since 1970 Renault has been producing engines with Peugeot without the two arch competitors becoming any closer because of this.

Gyllenhammar and Levy wanted their partnership—although announced as only an alliance at that time—to be understood from the outset as a single business entity. As early as last fall, the clear message went out to all management employees "to work in the future as if Renault and Volvo were a single company." Anyone who did not wish to support this policy—such as Volvo's former chairman of the board Roger Holtback or the former Volvo managing director and current head of development for Audi Gunnar Larsson—had to leave the twosome.

Each company has been involved in the decisionmaking process of the partners since the beginning of the alliance. Thus Pehr Gyllenhammar and his new chairman of the board Soren Gyll have seats and votes on the managing board of Renault S.A.; correspondingly Levy successor Louis Schweitzer sits at the management table of AB Volvo.

The intention to move beyond an alliance to merge the two companies thus existed from the very beginning. Amaury-Daniel de Seze, board member at AB Volvo and liaison with Renault, leaves no doubt about that: "The alliance boils down to increased participation." However, economic pressure has caused the merger to occur earlier than planned.

Because, whereas Renault chairman Raymond Levy successfully managed to rejuvenate the model offerings of his company and to increase production and thus, albeit with the help of the extraordinary boom in unified Germany, to improve the economic base of Renault S.A., Volvo has been inexorably sliding into the red.

Renault Overtakes Its Partner

Because of the fact that sales in its largest markets in the U.S., Sweden, and Great Britain collapsed, in 1991 alone the Swedish automaker had to cut back its autoproduction by almost 20 percent compared to the previous year, to 275,000 units. Consequently, sales dropped to 77 billion krona (still 91 billion in 1989); operating results fell to -1.2 billion krona.

Gyllenhammar's last attempt to bring this financial imbalance back into equilibrium—and to secure his ambitions for the chairmanship of a joint company—failed. The economic tycoon accustomed to power wanted to merge his company out of hand with the food conglomerate AB Procordia (annual sales: more than DM10 billion), of which Volvo had obtained more than 40 percent of the shares at the end of 1989 in exchange for the transfer of its subsidiaries Provenda and Pharmacia. With this coup the automaker would not only have significantly reduced his financial problems—because of Procordia's full coffers—but would have also been able to carry more weight in a merger with Renault.

However, to Gyllenhammar's astonishment, the Swedish government, which holds the second largest group of Procordia shares, refused to approve the merger. This takeover would have completely contradicted Prime Minister Carl Bildt's privatization policy to open the country to foreign investors. Thus it became clear that Gyllenhammar would have to settle for the roll of junior partner in a merger.

On the other merger front—Renault-Volvo—the French government was also causing problems. Above all, Prime Minister Edith Cresson, who was removed from her post in April, vehemently fought against a closer union of the two automakers, feared that the Japanese Mitsubishi Corp., which has been linked by a joint venture with the Swedes since 1990, could obtain some influence over Renault.

Learn From Japan

In fact, this Japanese-Swedish cooperation interests Renault's new chairman Louis Schweitzer. Beginning in 1993 about 200,000 small cars are to roll off the assembly lines of the NedCar joint venture in the town of Born in the Netherlands, half bearing the Mitsubishi name and half Volvo.

Renault will not only be able to supply all the diesel engines and approximately half of the transmissions; the engineers at Boulogne-Billancourt can also profit in this manner from Japanese quality assurance and production organization. This is a pragmatic attitude which the new French Prime Minister and former Minister of State for Economy and Finance Pierre Beregovoy shares. He is therefore no longer placing any obstacles in the way of closer cooperation with Volvo.

In the now imminent merger Renault will assume operational responsibility for the automobile sector, in which the French automaker is already making more than 80 percent of its sales. The Swedish partner is to head up the truck sector in which a third of Volvo's business originates.

The future joint company does not have too much time to consolidate its forces profitably. Both companies are already in the red in the truck sector. Especially the American commercial truck subsidiaries Mack (Renault) and Volvo GM Heavy Truck are booking high losses. And if Renault should fall back to its former market share in Germany in automobiles, the profits would also disappear in the auto sector.

In any event, the Swedish-French couple no longer has any time—the experts formerly suggested 10 years as the time needed for a successful merger.

Siemens-Skoda Joint Power Station Venture Encounters Setback

92MI0703 Bonn DIE WELT in German 25 Aug 92 p 15

[Text] Siemens AG of Munich and Berlin has learned a hard lesson from the "surprising" decision of Skoda Prague AG to back out of the planned "Skoda Energy" joint venture. The agreement, concluded in November 1991, provided for a 33 percent joint participation by Skoda Prague AG and Skoda Pilsen AG in the planned power station enterprise. Siemens was to hold 57 percent of the stock, the French reactor builder Framatome of Paris holding 10 percent. The involvement of the more substantial Skoda Pilsen AG will continue.

Apparently, the Prague company primarily saw Skoda Energy as an opportunity to shed longstanding financial liabilities. Once Siemens had categorically refused to share responsibility for "incalculable risks" arising from old contracts, Skoda withdrew at a time "when negotiations had not even been concluded," said Wolfgang Breyer, spokesman for the Power Engineering Division in Erlangen.

Having learned from this bitter experience, Siemens now intends to go ahead with a three-way joint venture. Breyer did not rule out a realignment of the capital shares. Plant engineering, for which Skoda Prague would have taken responsibility, was now to be transferred by Siemens. "We can put the joint venture into operation right now even without Skoda Prague," Siemens claims optimistically.

However, the Czech trade legislation that came into effect on 1 January 1992 is posing new problems for Siemens (1990-91 revenue for this division: 5 billion German marks [DM]). The group interprets it to imply lifelong liability on the part of the suppliers of engineering plant. In the case of nuclear plants, it would not be the owner, as in the West, but the manufacturer who carried responsibility. This was unacceptable to Siemens. "We need rapid legislative harmonization from the Czech government."

The worldwide group could nevertheless use its naivete in its dealings with Czechoslovakia ("We assumed they had a market economy," says Breyer), to solve a fundamental problem: No one at the Ministry of Economic Affairs in Bonn has so far given any thought to how such trade legislation issues affect joint ventures in Germany's neighboring country.

France's SEP, Italy's BDP Form Europropulsion

92WS0778B Paris AFP SCIENCES in French 30 Jul 92 p 12

[Text] Paris—The president and general director of the European Propellant Company (SEP), Jean Sollier, and BDP Difesa and Spazio's deputy administrator, Enrico Bondi, signed the shareholders' agreement and charter for the equally-held joint company Europropulsion on 23 July. SEP made the announcement in a communique.

Europropulsion had existed as a consortium since 1985. Its transformation into a corporation, the communique stresses, reflects "the desire of the two parent companies to make their joint organization more accountable by giving it more autonomy."

Pierre Quetard, an administrator recommended by BPD, was elected president and general director of the new company; Jean-Pierre Ledey was named assistant general director. Europropulsion will continue to act as chief contractor for the development of the solid propellant engine (MPS) for the European rocket Ariane 5. It will be the only direct contractor with the National Center for Space Studies (CNES), which the European Space Agency has appointed as chief architect for the MPS program.

Thomson, Siemens To Submit Joint Eurocontrol Bid

92WS0795B Paris AFP SCIENCES in French 20 Aug 92 p 10

[Unattributed article: "Thomson-Siemens Partnership to Modernize Air Traffic Control in Europe"]

[Text] Paris—Thomson CSF and Siemens have signed a cooperation agreement to answer the invitation for bids issued by Eurocontrol (the European organization in charge of harmonizing air-traffic control) to modernize and integrate European air-traffic control systems, the French group indicated on August 14.

The two companies agreed, in a first stage, to submit a joint bid for an air-traffic controller workstation procurement contract. A total of 500 workstations are involved: Eurocontrol needs only about 50 stations for its Maastricht (the Netherlands) center, and the largest part of the contract (about 450 stations) is destined to the Frankfurt regional air-traffic control center of the German air navigation (Federal Flight Safety or BFS) organization.

After this first installment, worth about 500 million French francs [Fr] of work, it is all the modernization and integration of European air-traffic control systems that is at stake. Manufacturers estimate the potential market at Fr10-20 billion of work over the next 10-15 years. The Thomson-Siemens partnership aims to thwart IBM's ambitions in this respect.

The Eurocontrol programs affected by the agreement involve in particular the implementation of the "S mode" on future radars, which will then be able not just to locate aircraft, but also to establish connections with them, making it possible to exchange many data automatically (flight parameters, procedures, etc.). Voice communications between the crews and the ground will be reduced accordingly. The European Program for Harmonized Air-Traffic Control (PHARE).

CORPORATE STRATEGIES

Projects, Strategy of French Neural Systems Company Noted

92BR0555 Paris ELECTRONIQUE INTERNATIONAL HEBDO in French 11 Jun 92 p 33

[Interview with Serge Dahan, CEO of Mimetics, by Raphael Font: "First Launch Products That Make People Talk About You"]

[Text] In order to be successful, Mimetics (neural networks) intends to concentrate on vertical market niches. "We will grow faster with products than with services," explains its chief executive officer, Serge Dahan.

ELECTRONIQUE INTERNATIONAL HEBDO [EIH]: Mimetics started its activities in 1991, a bad year. Nevertheless, your company now publishes promising forecasts (see box). How did you manage to survive this difficult economic situation that was fatal to many young small and medium-sized companies?

Dahan: Initially, the company intended to concentrate essentially on services and [software] engineering and to achieve strong growth immediately. In this case, a lot of money was needed; since the company was undercapitalized, our project was not viable. This is why there are financial organizations in our equity capital. But these investors obviously expect a significant return on investment, which we would never have been able to achieve with our initial policy. In services and engineering, the decision cycle at the customer level is much longer than for products. Growth, both in terms of sales and profits, is slower in services than in products.

Thus, it was decided to redirect our strategy and, in the first quarter of 1991, we opted for a range of products to achieve future growth. Obviously, there had been plans with regard to product development right at the start-up of our company, but this was a long-term goal. Thus, timing had to be modified. If this decision had not been made, we would have been in a very difficult situation now.

For a young company, it is important to have a range of standard products available, not only for obtaining a cash flow, but also for commercial development, reputation, and the brand image. In addition, such a product range may also be a bait to hook service contracts.

The products that we brought out enabled us to make it into the press. If people are to trust you, they have to know you. You have to make yourself known on the market: If you do not exist, you will not grow. A young company must be very communicative.

EIH: On which products do you work to ensure the success of your company?

Dahan: To be successful, you must not get involved in too broad a product range; we are therefore concentrating on three vertical markets: optical character recognition; access control by face recognition (an initial product is to be launched next year); and forecast of exchange rates on the financial markets. These three fields of application are adapted to our know-how in neural networks.

In order to accelerate our optical character recognition activity, we acquired Inovatic, a company which had gone into bankruptcy, in the summer of 1991. Inovatic provided us with a distribution network, a customer base, a brand image, and products. We were able to merge our know-how with Inovatic's experience in conventional optical recognition technologies and, last March, we launched EasyReader, the first automatic neural-network-based character recognition software. We gained a year and a half due to the purchase of Inovatic.

With EasyReader, we are ahead of the competition by several months. Our aim for 1993 is to gain a 20 percent share of the European optical recognition market.

We also expect to make additional acquisitions, because our knowledge of some of the vertical markets we are targeting is inadequate.

[Box]

Mimetics: 22 Million French Francs [Fr] in Neural Networks in 1992

Mimetics, which was set up in 1990, is one of the very few companies in the world specializing in neural-network-based products and services. However, at its creation date, it was merely a company name still waiting for investors. It became effectively operational in February 1991, when four financial organizations entered its capital: Haussmann Ventures (Thomson group); SCBF (France Telecom group); Finovelec; and Baring Venture Partners.

Mimetics currently employs 27 people (including 18 engineers); personnel costs amount to 75 percent of overall corporate expenditure.

During its first year of operation [1991], the company reportedly produced 10.5 million French francs [Fr] in sales revenues, including some Fr8 million in services and engineering and Fr2 million in products. R&D expenditure represents 70 percent of the company's sales figure.

The 1992 sales figure is expected to amount to Fr22 million, including Fr11.5 million in products. The company managed to break even in its first fiscal year; for this year, a net benefit of Fr1 million is projected. Among the initial customers are Thomson-CSF, the French Post office, and Mediametrie.

Mercedes-Benz's Downsizing Investment Strategy Explained

92WS0612C Duesseldorf HANDELSBLATT in German, 4 Jun 92 p 15

[Text] The workforce of Mercedes-Benz will be substantially cut back in 1992. In the next few years it is to be reduced by 20,000 employees "and more," Chairman of the Board Werner Niefer has announced. This is necessary, according to Niefer, in order to safeguard the earning power of the company.

By the end of 1992, there should be a reduction of 8,000 to 10,000 employees in Germany at Mercedes. Some 5,000 of them have already been "quietly" cut back through labor turnover (also the expiration of term contracts), and " '58 regulations," said Niefer at the yearly press conference of the automobile enterprise of the Daimler-Benz group. At the end of 1991 about 185,000 of the 237,000 Mercedes employees were working in Germnay.

Niefer as well as the future chairman of the board of Mercedes, Helmut Werner, emphasize that Mercedes still stands on a "solid profit foundation," but that the increase in turnover of 1991 has not expressed itself correspondingly in profits. For the long-term safeguarding of earning power "further far-reaching programs for the improvement of the cost position have been introduced," according to the above. The last wage agreement "had not been helpful" in achieving this goal according to Niefer. It would cost Mercedes about DM600 million a year, and in the long term would also cost jobs.

The current cost and profit improvement programs had already had a positive effect according to Werner. Of the DM4 billion a year, which was the goal, and which was to be turned over by 1995, barely one-half had been realized by the end of 1991. The cost-saving programs were to be understood as a dynamic process, which would be continued on a permanent basis. This probably also explains the fact that Niefer is now for the first time talking about a job reduction of more than the previously mentioned 20,000 jobs. Especially the motorbus branch in Mannheim, which is operating at a loss, is supposed to be made profitable.

The profit improvemnt programs will be accompanied by an "ambitious investment offensive." In 1992, DM5.1 billion in material facilities and DM3.3 billion in research and development are to be invested—a total of DM8.4 billion as compared to DM7.5 billion in 1991. The turnover, which in 1991 had risen by 12 percent to DM67 billion, is expected to increase to over DM70 billion. In this process Werner hopes to hold the present profit level, which in view of the worldwide marketing propects, he would estimate as "a good result."

In 1991 also the Mercedes group had only been able to hold the yearly surplus (of DM1.5 billion) at its current level, although in spite of high starting costs, substantially higher outlays for new products, and debits on the yield (stated by Werner to be around DM300 million), which were caused by the rate of exchange. The special domestic economic situation had led to a marked increase of DM120 million in the annual surplus of the company, bringing the total surplus to DM1.1 billion, whereby the declining annual surplus contributions from abroad could be offset. The commercial vehicle branch was able to increase its contribution to the yield from 30 percent to 40 percent.

Werner points out that the cash flow, which has increased by 9 percent to DM5.5 billion, has been sufficient to finance the investments, which have risen from DM3.5 billion to DM4.2 billion, and in addition to this has also covered the yield of DM1.3 billion, which has been paid to Daimler-Benz.

The prognosis that in 1992 a similarly good yield can be achieved is based on the expectation that Mercedes will be able to reach the sales figures of the previous year both in the passenger car and commercial vehicle trade. With respect to passenger cars, sales planning is providing for 559,000 to 569,000 units, and for commercial vehicles for over 292 units.

Even though the newly introduced "S" class is being more hesitantly taken up by customers than had been expected at Mercedes, Niefer believes that with its wide range of product innovations Mercedes has "many strings to its bow," and therfore has a good chance of "by and large adding to the sales of last year." In Germany, after the special economic situation comes to an end, the volume of the previous year will not be attainable; in the first third of the year new registrations of Mercedes vehicles here had been 6 percent lower than their level in the previous year. On the other hand a slight recovery on the western European markets had led to a sales increase of 4 percent. This however could not offset the lack of volume on the domestic market. Business in the U.S. has been considerably more encouraging, and the sales there for April were at 18 percent above those for the same period of the previous year. In Japan sales are definitely falling off. Niefer qualifies by saying that a fundamental recovery in Mercedes's most important foreign markets is not discernible.

The commercial vehicle market, according to Niefer, by April had once again strongly rallied in Germany, and Mercedes vehicle registrations had risen by 5 percent. However, the situation concerning orders pointed to a normalization. In Western Europe there were slight signs of a recovery in individual volume markets. In the U.S. the subsidiary Freightliner had been able to increase sales disproportionately in the sector of heavy trucks. In

the area of commercial vehicles on the whole Niefer sees "good prospects of linking up to the record year of 1991 both in production and in sales."

Privatization of Eastern German Electronics Industry Begins

92MI0702 Bonn DIE WELT in German 22 Aug 92 p 11

[Article by Uwe Mueller: "Electronics in the East—The Long Road to Privatization—First Chip Factory Sold to California Investor—Question of Financial Responsibility for the Resulting Costs Completely Unresolved—Into the Black in Three Years"]

[Text] The battle surrounding the privatization of the eastern German microelectronics industry is entering its last round. "It is highly likely that the problem will be solved in the next four weeks," stated Eckhard Gehring, the Trust Agency director in charge of the negotiations. By then, according to Gehring, a new ownership structure will have been found for each of the locations in Dresden, Erfurt, and Frankfurt/Oder that together make up Mikroelectronics and Technology GmbH (MTG).

But Gehring is keeping quiet about the fact that his authority has already discreetly sold the first chip factory. According to information made available to DIE WELT, a consortium signed a takeover contract for MTG at Erfurt last Tuesday. The California company, LSI Logic, which now holds 19.8 percent of the capital, emerges as the industrial investor. The remaining 80.2 percent is held initially by subsidiaries of major banks. There are good reasons for the secretiveness of the Treuhand, which usually broadcasts its sales successes from the rooftops: The matter of who will have to take responsibility for the costs that the deal will entail, and which will run into millions, is still completely unresolved.

The vast deficits, run up by the organizations on which Erich Honecker's vision of a high-technology GDR once rested, mean that they cannot be privatized without massive subsidies. With sales income of 80 million German marks [DM], the manufacturers of application-specific integrated circuits [ASICs] last year made a loss of DM300 million. Optimistic forecasts predict that it will take at least three years to achieve a break-even situation. The Trust Agency has therefore promised the purchasers a DM250 million contribution to the restructuring costs for Erfurt and Dresden alone. Added to this, assets estimated at DM150 million for the two companies have been handed over free of charge.

For the total of 1,500 jobs left in this sector out of the former 21,500, this was an excess of generosity, said Fianace Minister Theo Waigel of the CSU [Christian Social Union]. The House refused to grant the Trust Agency budgetary approval and demanded that the laender in question contribute. "Where the microelectronics industry is concerned, we are not talking about an ordinary privatization, but about structural and regional policy," is the Ministry of Finance viewpoint. The western laender would have to contribute 30 to 50 percent in comparable projects, but only about 25 percent would be required from the eastern laender—i.e., DM50 million each for Dresden and Erfurt.

Pleading empty coffers and placing the responsibility with the Trust Agency, politicians in the East have rejected Bonn's suggestion. It was only possible to push the MTG sale in Erfurt through because the investors were guaranteed restructuring resources that would initially bypass wrangling at the federal and land levels. The word at the Finance Ministry in Thuringia is that "there are indications that the federal government is giving way."

However the dispute ends, it will probably be difficult for Gehring to adhere to his four-week plan. MTG at Frankfurt/Oder is his greatest worry. The factory is antiquated and its proximity to the Polish border further reduces its appeal. An insider says: "The Trust Agency's negotiations with a foreign investor are proceeding in an extremely vague fashion." There are better prospects for Dresden, where a solution comparable with Erfurt is ready for signature. Here, another California company, VLSI Technology, also intends to come on board with a 19.8 percent stake.

Subsidiaries of the Commerz Bank and Dresdner Bank are providing the remainder. The banks are not acting in pursuit of their own interests, having been pushed into participation. The Free State of Saxony—which gives high priority to saving industrial locations, but does not wish to take on the role of stockholder—is securing their risk with guarantees.

VLSI Technology also has a three-year option on a majority holding. For the two American companies, which already produce circuits in America, acquiring a foothold in eastern German microelectronics with the aid of sweeteners from public funds makes sense. Production facilities in the new laender mean the single European market can be served without high import duties.

Press Reports DASA Purchase of Fokker Appears Final

92WS0752B Paris LE MONDE in French 27 Jul 92 p 17

[Unattributed article: "Hard-Won Agreement for the Takeover of Fokker by DASA: Netherlands Government Has Given Its Green Light"]

[Text] The Hague—After five months of difficult negotiations, the takeover of the Netherlands aircraft builder Fokker by the German DASA (Deutsche Aerospace) industrial complex seemed to have reached a final outcome on Friday, 24 July. However, the negotiations almost ran into a roadblock in mid-July when the Netherlands government, which holds 31.6 percent of Fokker stock and which is thus the company's largest

shareholder, stepped in to declare that the agreement plan established by that time was inadequate. Prime Minister Ruud Lubbers himself made it quite clear on 14 July that without an improved agreement the government would oppose the merger—which provoked lively criticism from DASA.

The new agreement in principle with which the three parties concluded negotiations on 24 July appreciably improved Fokker's position within the future European aviation conglomerate. Although DASA obtains 51 percent of Fokker stock, the Netherlands government will be able, thanks to a financial aid fund, to retain some influence on the important decisions concerning Fokker's development. Also, 49 percent of the added value of the 65- to 130-seat planes built by Fokker will be deposited to the account of the Netherlands company. The assembly activities of the planes, currently built by Fokker, will remain in the Netherlands. However, the Netherlands did not succeed in obtaining guarantees relative to the Fokker 50 turboprop which will have to compete with similar machines from Aerospatiale and Alenia, also members of the holding company. And finally, the eight-year right of veto for important decisions regarding Fokker, on which the Netherlands government insisted so strongly, was reduced to three years, in the face of the categorical refusal of DASA's president. The price of the takeover has not yet been fixed; however, it will probably be in the neighborhood of 3 billion French francs [Fr].

Philips's Timmer on Losses, Strategy

92WS0766B Duesseldorf HANDELSBLATT in German 7-8 Aug 92 p 13

[Article by A.E.I.: "Philips Electronics, N.V." Net Profits Fell Off Drastically, but Not As Catastrophically As Anticipated; Timmer: 'Philips Has Enough Strength and Endurance'"]

[Text] Eindhoven, 6 Aug 92 (HANDELSBLATT)—During the first half of 1992 the net profit earned by Philips Electronics N.V., Eindhoven, dropped drastically, but not catastrophically, as anticipated. According to information provided by the company, the net profit dropped from 687 million florins in 1991 to 256 million florins during the first six months of this year.

But this decline appears to be bigger than it actually is: In 1981 Philips sold its remaining shares in the household applicance company, Whirlpool. The proceeds of this sale resulted in a positive balance of 365 million florins. However, if the net results of normal business activities are compared with one another, the decline in profits turns out to be smaller: from 322 million to 256 million florins (about 22 percent). The net profit from business activities fell off only slightly: It dropped from 1.31 billion to 1.27 billion florins. The net turnover dropped from 26.2 billion by only about one percentage point to 25.84 billion florins.

It was not sales that produced the negative effect, but the 3 percent lower prices. The combine's problem child, Sparte Consumer Electronics, is in particular to blame for this. Turnover and the evolution of profits were from good to satisfactory in all other company divisions. Especially in the Sparte Lighting Division, Philips achieved an improvement in operational profits of from 261 million to 429 million florins (an increase of over 60 percent).

But the successful audio carrier subsidiary, Polygram N.V., and the household electrical appliances as well as the professional equipment and systems divisions also produced positive returns. Only the marketing of consumer electronics continues to be problematic. According to information provided by chairman of the board Jan D. Timmer, who personally presented the figures, the poor situation will only change for the better in the medium term.

Timmer: "Many millions of television sets are still stockpiled worldwide. Not before they are gotten rid of will prices return to normal levels. The old stocks will have to be reduced in a price war first. That will take some time yet. But Philips still has enough strength and endurance to get through this phase. Nevertheless, things look black for many a firm in the industry."

Philips's top man referred to the positive effects of his "Centurion" rehabilitation program. He said that the improvement of efficiency has substantially contributed to the fact that the combine is at least financially moving in the right direction again: "If the world economy starts to pick up again, consumer electronics will immediately benefit from it." But, as long as this is not the case, it must be assumed that turnover and net profits in 1992 will not correspond to their levels in 1991. Since Timmer himself commented on the half-year figures—which is an unusual occurrence—there were conjectures in Amsterdam financial circles as to further drastic developments in the business sector. These have not, however, proven to be well-founded. The chairman of the board came to the press conference for the sole purpose of denying rumors about the failure of the European high-density television (HDTV) project.

Recently there have been reports that, together with its partners, Thomson in France and Nokia in Finland, Philips is not in a position to implement the European transmission of HDTV in HD-Mac standard in the allotted time (see commentary below [92WS0766D]). Meanwhile, according to the reports, Philips has invested 7 billion florins in the European HDTV project. Timmer denied the validity of this figure and criticized the reports. He had only a single word for the negative reporting that had ensured a sharp drop in the value of Philips shares within a few weeks time: "Nonsense." Nevertheless, Timmer made provision for the future: "If the subsidies the EC will be deciding on in December are not forthcoming, we'll have to reevaluate our position."

France: Cybernetix Pursues Expansion, Innovation

92WS0767A Paris ROBOTS in French 30 Jul 92 pp 3, 4

[Article entitled: "Robotics: Cybernetix's Policy of Continuous Innovation"]

[Text] Ever since its creation in 1985, Cybernetix, the Engineering Company for Automated and Robotic Systems, has pursued a policy of technological innovation and nonstop research. The company has funneled 10 to 15 percent of its sales (120 million French francs [Fr] in 1991) into R&D, and collaborated with organizations such as the Marseille International Institute of Robotics and Artificial Intelligence (IIRIAM) and the Marseille Automation and Data-Processing Laboratory (LAIM). Cybernetix is a subsidiary whose shareholders include Technicatome (Atomic Energy Commission, 33 percent), Comex (31 percent), and Innolion (10 percent). The group has also taken over several firms since 1987, to promote external growth and expand its base of expertise. They include Luminy Instruments (surface analysis of materials); RVV (Cisi Ingenierie's robotics, vision, and videocommunications offshoot), which spawned Rol (manufacturing robotics, mobile robots—for cleaning the Paris subway—and videocommunications); SAIA (an AI applications company); Coria (robots and automatons for the nuclear industry); ERV-Secia (robotics, computer-vision systems); and Secimo, which prompted Cybernetix to found Secia Industrie (research and fabrication of special machines). With all these acquisitions under its belt, the group managed by Charles Palumbo aims to step up its manufacture of repetitive products (design and programming software packages, smart power converters, proprioceptive failure detectors, etc.) and become the leader among small French mobile robotics firms independent of big groups. Counting its three subsidiairies Rol (Paris area), Secia Industrie, and Secimo (Manousque), Cybernetix now employs 200 people, 60 percent of them engineers. It is active in a variety of fields, the following among them:

—robotics of difficult or hostile environments (offshore, nuclear, military). Products include its TSR 200 intervention robot (to retrieve heavy packages in tight spots; operating range 200 meters) and the RMP 30 Protector robot (mobile robot to work in tight spaces, baggage holds, airport storage areas, ship walkways, etc.). Cybernetix is developing a computer-aided remote-control system for submarine applications. It is participating in the European Jet and Net nuclear fusion projects (it has delivered a remote-controlled maintenance vehicle) and work to develop the Intervention Robot Fleet in case of a nuclear risk. Finally, the company is helping develop the Vigiland robot to monitor sensitive sites.

—post-office robotics. This includes integrated robotized systems to automatically load letters into sorting machines and remove packages in progress, processing of parcels, and design of the postal sorting network that will be used in the year 2000.

—semiconductor robotics. Development of a robotized wafer-testing line for SGS-Thomson; manufacture of micromodule boards; an automated surface-analysis system; and a robot to handle wafers in clean rooms.

—industrial robotics, including a robot to weld ship hull components coupled with a CAD/CAM process; a submerged vision system for GDF/DETN; and a robotized unit for deburring. CAD featuring robotics simulation. The purpose of the remote-controlled demonstrator Dato, which is equipped with the 3-D interactive modeler Pyramide, is to physically validate the most innovative solutions for remote control of an arm and mobile base. In laboratory robotics, the group developed Manilab, which handles light loads in a confined space.

Cybernetix is also working on Commutor, a new design developed by the French National Railway Company (SNCF) for rapid transfer of goods. Cybernetix (Charles Palumbo, president; Cecile Jatteau, public relations) - Chateau Gombert Technopolis, Rue A. Einstein, BP 94, 13382 Marseille cedex 13, Telephone: 91.66.10.00.

German Group Studies Electronic Equipment Recycling

92WS0768B Munich ELEKTRONIK in German 21 Jul pp 16-17

[Article by R. Hopperdietzel, J. Franke, G. Liedl, J. Schiebisch, D. Tartler, M. Fischer, P. Schuderer: "Recycling Electronic Equipment"—first paragraph is ELEKTRONIK introduction]

[Text] Since recycling electronic equipment requires knowledge of the most varied fields of work, an interdisciplinary working group, RECI—Recycling Circle, has been formed at Erlangen-Nuremberg University. RECI's field of work ranges from development and design suitable for recycling all the way to disassembly and recycling of old equipment. To complete the offerings one also develops logistics concepts and carries out studies of the economic effects of recycling.

The necessity to assure nonpolluting waste disposal and to save resources has generated the requirement for greater recycling of technical products. Innovative technologies and rapidly changing fashion trends are responsible, primarily in the electronics industry, for the fact that equipment in part still intact is often prematurely replaced. Annual growth rates of 5 percent and more are presently being calculated in this field. As a result of this development, the accumulating volume of electronics is constantly growing. Estimates by the Federal Environment Ministry are for a total volume of about 800,000 tons per year. The existing waste disposal industry is not yet prepared for this sudden increase in volume.

The problem consists not only of the amount of annually accumulating waste, but more specifically of the complex composition of this type of waste. On the one hand, the valuable material it contains represents an incentive to utilize reprocessing methods, but on the other hand the heavy metals contained in it and the furans and the dioxins which form during combustion entail risks in themselves.

When the Electrical Equipment Recycling Ordinance takes effect on 1 January 1994, the lawmakers will introduce obligatory return and waste disposal for manufacturers, operators and importers of electrical equipment. The decree will include the following groups of equipment[3]: Household equipment, entertainment electronics, technical office, information and communications installations, equipment for monetary transactions, electric tools, measurement, control and regulating installations, illumination equipment, toys, clocks and watches, laboratory and medical technology equipment, video recording and image reproduction equipment.

In order to be able to solve the problems of disposal and combustion, efforts must be made to close the cycle of parts or raw materials, respectively. Only recycling can contribute to the solution of the waste disposal problems. Depending on the basic recycling strategy, one differentiates between the methods of reprocessing (dissolution of the product form) and reconditioning (retention of the product form).

The objective is to develop economic methods of disassembly, reconditioning and reprocessing. For future products the aspect of recycling must be introduced as early as during development. Another important task is to organize the waste disposal logistics. The RECI at Erlangen-Nuremberg University is working on the described set of problems on the basis of actual industrial projects.

Recycling-Suitable Design of Electronic Products

The designer determines a large part of the product costs for manufacture and use and therefore has special responsibility. The demands on the design are further added to because of the ecological necessity and economic opportunities of recycling.

In contrast to the problems of disposal of used products, recycling-suitable design of new products is a forward strategy. Because of the increasing proportion of waste, the costs measured over the entire lifetime and the potential rationalization potential, special attention must be paid to it.

Product design includes:

- Product planning, which defines the requirements, cost framework, target group, etc. and which should firmly incorporate recyclability, above all, into the goals and objectives;
- Development, which provides the technologies and principle of function;
- Design, which selects materials, creates the geometric form and determines the combination techniques;
- Production scheduling, which designs the production and assembly processes.

Efficient product design can only be achieved through integrated thinking and parallel processing by these areas.

Within the framework of the Recycling Circle (RECI) at Erlangen-Nuremberg University, in close cooperation with companies manufacturing electronics, guidelines for product design suitable for recycling are being gathered, developed and structured. For this purpose, at the Chair for Production Automation and Production Systems, computer-supported tools are being developed which are intended to focus on these rules and to monitor them by means of so-called Recycling Rule Checks at a very early stage in the product creation phase. Analogous to the research work in the fields of Design and Manufacturing Rule Checks, this takes place in a twofold approach: Development of special software tools as well as implementation of the resulting rules directly into the CAD systems.

Disassembly Technology

Recycling of products requires (partial) disassembly. To assure this principle it is necessary to look at the systematic arrangement of the recycling process. In so doing one basically differentiates between renewed utilization and recycling of used products or parts of them[1]. Renewed utilization requires reprocessing of components or individual parts, which for reasons of production engineering includes (partial) disassembly. Product recycling implies dissolution of the product form for the purpose of recovering raw materials. For reasons of quality assurance, the fractions of materials resulting from this reprocessing procedure must come out as pure in their kind as possible. Disassembly (partial) is required in order to assure high purity in the secondary raw materials.

Since equipment disassembly at present takes place primarily manually and is connected with high personnel costs, the question of the necessary degree of disassembly occurs. In this context the so-called Recycling Rate was introduced as a characteristic quantity for the specification of the recycling process. It describes the degree of separation of a piece of equipment in material proportions. Studies of how this might be carried out by using television sets, for example,[4], show that even crude disassembly of the products holds out the prospect of a high recycling rate. Significant increases in disassembly time, and thus of the costs, bring only scant improvement in the recycling rate.

There remains the problem of the disassembly technology to be used. At this time manual disassembly predominates, except for a few pilot facilities. Typical characteristics of used products, such as impurities, corrosion, damage or product modifications, can be given consideration in a flexible way by the worker. To

an industrial robot this poses multiple problems due to its lack of "sensors," "experience," as well as "technology." On the other hand, in order to reduce disassembly costs and humanize the work place, the innovative process should be aimed in the direction of automated disassembly. A first step may be seen in the gradual mechanization of manual work stations.

As already mentioned, crude preliminary disassembly yields satisfactory recycling rates. The development of economically operating tools for nondestructive as well as (partially) destructive preliminary disassembly of electronic equipment represents an innovative project at the Chair for Production Automation and Production Systems at Erlangen-Nuremberg University. The use of multifunctional, sensor-supported, components guarantees high flexibility for the most varied disassembly tasks.

The design of the disassembly process depends greatly on the preceding assembly process. As significant initial conditions might be mentioned the material and production-technical composition, as well as the combination techniques used. Another aspect therefore consists of looking at the design of the interdependent assembly and disassembly processes in an integrated manner and optimizing them from the aspects of technology, economics and ecology[2]. Because of the complexity and multiple dependencies, a computer-based tool is being developed for this.

Recycling Synthetic Materials

Today recyclability is an important criterion in selecting materials. However, economic recycling of synthetics is only possible if methods can be developed which can produce qualitatively competitive recycled materials. The most important precondition for recycling synthetic waste is type purity and the absence of foreign matter and contaminants. Synthetic waste which does not meet these preconditions can be burned to produce energy. The heat content of synthetics corresponds roughly to that of heating oil. Methods for reprocessing and purifying greatly contaminated synthetics, which operate at high cost with regard to process technology and energy consumption, are not justified for reasons of economy and environmental technology. Recycled material from contaminated waste can only be used after costly reprocessing for less valuable applications. Storing the waste should be avoided due to the limited storage space available. For these reasons organized disassembly of electrical and electronic equipment makes it possible to obtain type-pure and thus recyclable synthetic parts.

After the construction and packaging sector, electrical engineering applications represent the most important application field for synthetics. In addition to housings and mechanically functioning parts, synthetics are used, due to their outstanding electrical properties synthetics, in cables, components, printed circuit boards, etc.

Experience with disassembly of automobiles shows that only larger synthetic parts can be economically disassembled, sorted and used. In electrical engineering these are primarily the housing components in computer technology and entertainment electronics. The majority of synthetics are used as housings in electrical engineering. Smaller, not type-pure quantities of synthetics are used in the printed circuit board, in components, plugs, cables, etc.

Recycling of a number of models and types of synthetics, which differ according to the manufacturer of the equipment, requires a great expense of sorting and logistics, if the synthetics are to be recovered as type-pure byproducts. The fireproofing equipment necessary for many applications, which is usually still based on halogen-containing fireproofing agents, represents another set of problems in reprocessing, since at this time there exist no simple systems for identifying the type of fire protection in old parts.

The Chair for Synthetic Technology, in cooperation with the South German Synthetics Center in Wuerzburg, is carrying out research projects and industrial projects for the recycling of synthetic materials. A well-equipped technology center is available with comminution and reprocessing equipment (cutting and hammer mill, separator, sieve jigger) and processing machinery (regranulation-extruder, injection molding, press, etc.), as well as a laboratory for mechanical, physical-chemical and thermal testing and microscopy of synthetic materials.

Automated Disassembly of Printed Circuit Boards

A considerable component of the electronic waste consists of printed circuit boards equipped with electronic components. Economically operated disassembly of flat modules, which is only done by a few progressive companies (in the United States, FRG), will become much more important in the future:

- Hazardous material-containing components (such as PCB-containing condensers) must be protected against further use.
- Efficient recycling requires the greatest possible preenrichment of the material.
- A growing market already exists for the marketing of high-grade electronic components (memory, programmable memory, processors, crystals, etc.)
- The highest storage costs can be saved with reuse/additional use and recycling.
- Nonpolluting concepts of waste disposal promote a market-relevant business image.
- The legal regulations require waste disposal at the highest technological level.
- By recycling at the highest possible level, primarily the most nonpolluting type of recycling is implemented.

The stripping of printed circuit boards, until now done manually, is not able to cope with the anticipated quantitites, however. Only by automating large segments of

these disassembly tasks will it be possible to handle the volume of flat modules which will need disposal.

Obsolete electronic scrap poses very high demands on automated disassembly (contamination, corrosion, damage, alterations, small serial runs, incomplete product documentation, separation in space and time between production and disposal).

For the reasons mentioned the demands for flexibility in an automated disassembly system must be made many times greater than for assembly. The concept for the required system must address these concerns through adaptable kinematics and tools, flexible controls and simple programming methods, the use of highly developed sensors and powerful pattern recognition. Bringing in the capabilities and know-how of the human being from ergonomic points of view is the uppermost goal of designing the system.

A disassembly facility based on the approximate concept shown in Fig. 4 [not reproduced] is being developed at this time by the Chair for Production Automation and Production Systems. It involves modular work stations which can be designed as manual or automatic and are connected with one another through mechanized systems.

In the first step the part heavily contaminated flat modules are cleaned in a nonpolluting process. By means of optical analysis, components with hazardous materials are recognized and valuable components determined. The component positions and characteristics reported are transmitted with computer support to the subsequent stations. Specialized disassembly cells (SMD [surface-mounted devices], VHV, exotics, etc.) remove the defined electronic components with selectively applied thermal energy. Downstream, the components are sorted, prepared and tested. The remaining components are mechanically evacuated in parallel from the circuit board.

Recycling Possibilities for Printed Circuit Boards

Disassembly technologies enable macroscopic sorting of components in electronic equipment and provide the foundation for reuse and recycling of old equipment. While parts of metal or synthetic housings are increasingly being reused, the fraction called "printed circuit board" resists material recycling because of its complex structure.

Figure 5 [not reproduced] gives the typical composition of a circuit board with components and shows the problems of material recycling: Such a circuit board involves a mixture of many substances composed of metal, metal alloy, glass, ceramics and, above all, a multitude of different synthetics. Exact knowledge of the composition of this blend of materials is a precondition for material recycling and makes it possible to locate, quantify and isolate the valuable or harmful substances. In order to clarify such questions, analytic and chemical methods such as X-ray fluorescence analysis, atomic absorption spectroscopy and polarography must be used. By using these and other investigation methods, it is possible to determine, for example, the distribution of valuable and harmful materials between the actual printed board and the components. This is shown for a few selected elements in Figure 6 [not reproduced]. Based on the results thus obtained, one must first evaluate existing methods to dispose of circuit boards, establish material flow diagrams and develop efficient recycling methods.

Recycling of printed circuit boards at present takes place with physical, thermal, metallurgic and chemical methods. Physical methods make it possible to separate the comminuted printed board material into a metal-rich fraction (such as 56 percent by weight metal, 10 percent by weight synthetics) as well as a synthetic and bromine-rich fraction (49 percent by weight synthetics, 7 percent by weight metal, 6.5 percent by weight bromine). Such sorting and enrichment processes are often incorrectly already called "disposal" or "recycling." In the sense of real recycling, these fractions must go through chemical, metallurgical or thermal processing steps before the pure substances are available for actual reuse.

With thermal methods the synthetic fraction is reduced and the metals contained in the circuit board material recovered by means of metallurgical procedures. The focus of interest here is Cu, Ni and precious metals. Toxic combustion products require effective waste gas purification facilities. Beyond that, with this method about 70 percent by weight of the original board mass is obtained in the form of "slag" and must be further disposed of. Chemical extraction methods lead to extensive isolation of metals, but also leave behind about 70 percent by weight of the original scrap mass in the form of insoluble compounds and synthetics.

Effective methods for utilizing circuit board scrap are primarily recognized by the fact that after conversion the lowest possible proportion of weight and volume of the original material quantity remains beind in the form of an "unusable" product (such as slag). A method combining the steps of "chemical extraction" and "synthetic recycling" will meet this demand. "Synthetic recycling" in this respect means reductive high-pressure techniques, solvolyses and polymer breakdown.

In addition to the most extensive breakdown of material possible, it is of crucial importance for recycling methods not to lead to a shifting of the problems. The "printed board" scrap problem must not be converted into a waste water or exhaust air problem. Effective methods for extraction, enrichment and solvent regeneration are needed. Along with chemical analysis problems these sets of questions are being studied in a research project at the Institute for Inorganic and Analytic Chemistry at Erlangen-Nuremberg University.

Recycling—the Logistics Chain Closes

The economic and long-term ecological success of recycling depends greatly on the success of logistics concepts.

Individually contemplated partial solutions usually appear highly efficient, but when expanding the horizon to include the desirable goal of "safeguarding the environment" they are often ineffective or even counterproductive. The ability to solve technical problems must thus be combined by means of intelligent links between all systems in the material cycle. Only through such a comprehensive view of all flow conditions can acceptable solutions be found.

When looking at the material cycle one notices that the logistics process repeats itself through recycling. Once again used goods must be obtained and added to the "production process" of disassembly or to recycling, in order subsequently to distribute them to those who recycle/make further use of or reprocess them.

The first step is to consider the purchase logistics. Here one must distinguish between various strategies. The customer surely expects that the product will be completely returnable at the end of the period of utilization. But how does one react when, for example in the event of repairs, only partial components have to be exchanged? Does it make sense to ship these components directly to the system supplier for further recycling? The influence of such considerations on a future selection of suppliers cannot be dismissed. To determine the supply depth ("make or buy" in disposal service) is therefore of a strategic character and represents a crucial factor for further company development.

After pointing out these rather more strategic problem areas, the individual logistic areas will now be examined. A significant problem sector in purchasing old equipment is the inability to plan for it. The customer, a recipient on the one hand, but a supplier from the aspect of recycling, can surely not be all that rigidly tied down, as is the case today from the aspect of actual purchasing logistics. The establishment of information and prognostic systems for the nature and quantity of usable materials, all the way to development of marketing concepts for repurchasing, must be considered here.

From the viewpoint of the disassembly process, the actual disposal logistics become the most important. The central idea of recycling—type-pure separation and preparation of the accumulating materials—here represents an expense which should not be underestimated. How to conceive such systems for economical design of, on the one hand, a disassembly process combined with the subsequent necessary purification and quality assurance tasks, and, on the other hand, additional distribution of the recycled materials while optimizing inventories, transportation and handling, must be a task for the future.

While in the existing production process an increasingly closer connection between purchasing and production logistics can be reported, in recycling this coupling is rather in the direction of waste disposal and distribution logistics. It must therefore be the objective here to optimize this "part" in a unit and to close the material cycle by connecting distribution with renewed purchasing.

Despite all the ecological concerns, quantification of the costs—particularly the logistics costs—remains the focal point in recycling electronic equipment. Furthermore, the already mentioned imprecise planning makes exact determination and quantification of these costs difficult. Although the logistics costs represent a considerable part of the overall costs, in most companies they are entered under general costs without any distinction. By so doing the most important information to support both strategic decisions and operational control in this field is missing. Anyone who succeeds in making the cost structure transparent in this field will not only open up major rationalization potentials, but will also enter the market with pricing that is stable—because it is sound—in the long term.

The company's system of goals must first generate disposal strategies, such as determining one's own disposal quantity. Based on that a disposal network will be designed, supported by computer, and subsequently configured. Within the framework of this network configuration the company will go through the following steps:

- An actual need analysis to illustrate all the disposal processes (quantities, times);
- Inclusion of all activities in the disposal network (such as disassembly/sorting/reprocessing/purification, transportation, transshipment, storage);
- Inclusion of all costs which occur during these activities.

Following incorporation of the basic data, the network is transferred to a computer-supported simulation model. Because of the cost transparency which is thus created, it is not only assured that a disposal controller to be implemented in the company will be able to guide old equipment economically through the disposal network, but also that individual technologies, which until now have been considered in isolated instances, will be able to influence the entire logistical chain evaluated. Thus, the most efficient way to sensible disposal logistics may be found for the company.

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EAST-WEST RELATIONS

Mercedes-Benz To Set Up Factories in CIS

92MI0666 Bonn DIE WELT in German 31 Jul 92 p 13

[Text] Professor Werner Niefer, chairman of the board of Mercedes-Benz AG, thinks that the Stuttgart automobile concern stands a good chance of being able to develop substantial business activities in some of the countries of the Commonwealth of Independent States (CIS).

This is particularly true of the three states Kazakhstan, Uzbekistan and Turkmenistan. All three states, which are in a good cash position thanks to their rich deposits of gold, oil, and other valuable raw materials, were visited by Niefer during a five-day tour, and he completed a number of declarations of intent.

According to Niefer, the focal point of the discussions held in situ with the governments was production sharing projects for commercial and passenger vehicles, and engine production. Speaking to the press in Stuttgart, Niefer was not yet willing to name any concrete figures, but the undertakings undoubtedly amount to thousands of millions in total. In particular, the negotiations relating to a Mercedes assembly plant for three-axle trucks in Turkmenistan, for example, had made considerable headway. In Uzbekistan there was substantial interest in a joint plant for all-terrain vehicles with an annual capacity of some 100,000 vehicles. "We shall be starting the project," said Niefer.

Niefer said that Uzbekistan also had a large-scale plant for tractor engines, but there were no sales outlets for the products produced there. Niefer thinks there are considerable opportunities for cooperation in that country extending beyond the motor car. Niefer can already chalk up one prestige success on the side: the entire fleet of Uzbekistan President Karimov is to be changed over to Mercedes-Benz vehicles.

In Kazakhstan, Niefer negotiated on the supply of not only passenger vehicles but also other products such as domestic irons and washing machines. He also visited a typical aircraft plant in Kazakhstan with 45,000 employees where the noise level and fuel consumption of the engines produced there were causing problems. The Daimler-Benz concern thinks there are opportunities there for involvement. In particular, both Kazakhstan and Turkmenistan had registered interest in cooperation in the assembly of commercial vehicles. In the coming week, Niefer intends to visit Russian President Boris Yeltsin in Moscow to explore the options in Russia. The financing of the Mercedes Omnibus project with Avtrokon is regarded as assured. The 0303 model, discontinued in Germany, is to be built there using the former production facilities of the Mercedes Omnibus works in Mannheim.

In response to press reports that orders are falling off for the "S" class, Niefer said that the 100,000th passenger vehicle of this class would be delivered in August, which is twice as many as the predecessor model during the same period. A new feature is that Mercedes is also supplying BMW with valves from their Bad Homburg works where engine timing gear parts are produced.

The question of whether Mercedes will build its own passenger vehicle production plant in the U.S. was indirectly refuted by Niefer with reference to the new Rastatt works. Helmut Werner, vice-chairman of the Mercedes-Benz board, underlined the importance of the North American Free Trade Area (NAFTA) for Mercedes-Benz and their Mexican production subsidiary Mercedes-Benz Mexico (MB Mex). This subsidiary is to start producing Mercedes passenger vehicles there in March 1993 (more specifically, the 500 SE and 400 E types). Initially, production would be confined to about 1,000 units per year.

MB Mex increased its market share of trucks over nine tonnes from 21 to 35 percent between 1986 and 1991. In the first half of 1992, that company sold 5,900 commercial vehicles which corresponds to a growth of at least 31 percent. The turnover in this period rose by 56 percent to 390 million German marks.

It was announced in Stuttgart that Mercedes intends to exhibit small cars which run without gasoline or diesel at the next IAA (international automobile exhibition).

German Government Funds R&D in CIS

92MI0674 Bonn DIE WELT in German 8 Aug 92 p 9

[Text] With a 40 million German mark [DM] aid program, Research Minister Heinz Riesenhuber aims to play a part, both this year and next, in ensuring that science will not fall by the wayside on the road toward democracy and a market economy in the successor states to the Soviet Union. Riesenhuber explained to journalists in Bonn yesterday that collaboration with these countries on research would be extended and expanded into new areas. The minister will discuss the details with his colleagues in Moscow and Kiev next week. According to Riesenhuber, more than 1,000 scientists could be

directly supported and the working conditions of 4,000 researchers further improved with these funds and the projects planned for their use. Owing to the favorable ruble exchange rate, the salaries of scientists in the republics of the CIS currently amounted to the equivalent of just a few thousand DM per year. In parallel with the aid program, the projects forming a part of the agreed scientific and cooperation program, for which almost DM30 million were available this year, would also be continued. According to Risenhuber, around DM20 million are earmarked for use of the space research infrastructure in the CIS countries next year, thus contributing to maintaining the able teams available there. Among the initiatives planned were further visits by German scientists to the "Mir" space station. Riesenhuber stated that the CIS countries were prepared to open up their science facilities for extensive international collaboration, and this also applied to the area of military research, formerly kept under close wraps, where there were some very interesting developments in, for example, laser research and materials science.

Volkswagen Foundation Subsidizes R&D in Central, Eastern Europe

92MI0679 Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German 10 Jul 92 p 10

[Text] The trustees of the Volkswagen Foundation allocated a total 66 million German marks [DM] to science at their summer meeting. A number of new funding initiatives, intended to benefit both the countries of Central and Eastern Europe and the new laender, were adopted as follows:

- A new sector, entitled "Collaboration with Scientists and Engineers in Central and Eastern Europe/Joint Projects and Summer School," has been added to the foundation's funding program. This new sector is not defined in further detail in terms of subject matter, but is intended to support fairly long-term projects. Its major purpose is to ensure the survival of existing highly qualified teams in Central and Eastern Europe by having them work directly with German scientists on joint projects, and to help remain competitive. The eastern European scientists will therefore be able to continue to work in their own countries, with temporary visits to Germany to further the joint projects. Knowledge transfer will also be promoted via summer schools and vacation courses.
- The trustees allocated DM7.5 million for grants to up-and-coming scientists in central and eastern Europe under an academic program intended to enable 300 young scientists in these countries who have distinguished themselves through the quality of their research and their achievements to spend six months at a German university, both undertaking research and also teaching. Regarding the subject range, the humanities and social sciences, which in the past have suffered undue neglect, will receive particular attention in funding allocations. The program will be run by the Mainz Academy of Sciences in Halle, on behalf of the Conference of German Academies.
- The trustees also allocated DM1 million in funding for cooperation between scientists from the Commonwealth of Independent States (CIS) and the Federal Republic of Germany in selected areas of mathematics. The former Soviet Union has an outstanding international reputation for its achievements in mathematics. The German side of the academic content and organization of the program is being handled by the Oberwolfach Mathematics Research Institute, an internationally renowned institution that has frequently received funding from the Volkswagen Foundation. Teams will be formed to address individual fields, each team being led by a CIS mathematician and a German working in the same field.
- Another new sector, entitled "Modeling Complex Process Engineering Systems" was also established. Process engineering involves the interaction between process components within a system, whereby substance, energy, and information flows are used to organize the components into a network.

The aim of the process, which is to produce materials with specific properties and quality at low cost and without environmental pollution, leads to increasingly complex systems. Modeling such complex systems in order to understand the multifaceted interactions between subsystems represents the central process analysis and synthesis problem currently facing process engineering in system design and operation. Modern computer engineering provides a particularly favorable basis for research in this field, though Germany currently lacks specific funding for process systems engineering. The Volkswagen Foundation's program is intended to remedy this problem: Funding will focus primarily on research projects, though it will also be available for interdisciplinary congresses, courses, summer schools, and research visits abroad.

EC Opens THERMIE Center in Bulgaria

92WS0754A Paris AFP SCIENCES in French 16 Jul 92 p 1

[Article: "Creation of EEC Organization for Promotion of Energy Technologies, in Sofia"]

[Text] Sofia—An Organization for Promotion of Energy Technologies (OPET) was inaugurated on 10 July in Sofia under the THERMIE program, financed by the European Communities Commission [ECC].

The OPET network encompasses over 40 organizations in Europe. The Bulgarian OPET has been named the Energy Center, and was opened by Mr. Rolf Mayer, head of the ECC's General Directorate of Energy.

The purpose of the Energy Center, said Mr. Mayer, is "to encourage the implantation of energy technologies in Bulgaria that already exist in Europe, and contribute to

the development of new technologies, with a view to modernizing the energy sector in Bulgaria."

The Bulgarian Energy Center's initial efforts will focus on reducing energy expenses in the food industry and big government buildings, on overhauling and upgrading the country's bus engines so as to reduce energy costs and pollution, and on installing new insulating materials on central heating systems.

France, Russia Sign S&T Cooperation Agreement

92WS0778A Paris AFP SCIENCES in French 30 Jul 92 pp 1, 2

[Text] Moscow—An agreement between Russia and France to step up "general collaboration" in science and technology was signed 28 July in Moscow by Boris Saltykov, Russia's minister of science, and Hubert Curien, the French minister of research and space.

The agreement calls for the two countries to work together to carry out "large projects or programs," "contribute to research on basic questions concerning the development of science and technology, including science and technology policy," and create "the material conditions" necessary for bilateral or multilateral initiatives in basic research.

The two parties will also strive to "broaden and encourage collaboration between them in industrial research and new technologies" and "promote the creation of joint projects that could be incorporated into current and future European and international programs." Such collaboration could take the form of researcher and engineer exchange programs, internships, and sister laboratory arrangements.

"We have deliberately avoided drawing up a restricted list of specific areas," said Mr. Curien during a press conference at the French embassy in Moscow. "But a Franco-Russian committee will draw up an initial list spelling out the topics for joint work, and the top scientific priorities, that are the most promising."

During the period between August, 1990 and the end of June, 1992, CIS researchers were awarded, among other things, 206 six- to 12-month postdoctoral grants, and nine six-month industrial research grants. Thirty researchers were hosted last year, for periods of six months, as part of sister-organization agreements between the physics department of the Paris Ecole Normale Superieure and the Moscow Landau Institute, and the department of theoretical and high energy physics of the Paris-VI and Paris-VII Universities and the Institute Steklov of Saint-Petersburg. Thirty-three researchers should benefit from such arrangements in 1992.

The Research Ministry used some of its own money available through the ACCES program to host 515 former Soviet researchers at 100 symposia. Twenty-eight French researchers traveled to Russia for summer schools through the PARCECO program.

With the support of MICECO, all of France's large research organizations (National Center for Scientific Research, National Health and Medical Research Institute, National Institute for Research on Data Processing and Automation, French Institute for Research on Exploitation of the Ocean, National Agronomic Research Institute, etc.) are planning initiatives with CIS counterparts in various fields, including molecular and cellular biology, cancerology, the environment, electronics, oceanography (fishing techniques, marine biology, and aquaculture), agronomy, and plant production. The Atomic Energy Commission has ties with several Russian research organizations, to pursue joint projects in nuclear safety and in basic research on surface and particle physics and astrophysics. Moreover, the National Center for Scientific Research is expected to sign a new agreement with the Russian Academy of Sciences this fall.

Mr. Curien reminded reporters that the European Community had just given the nod to the creation of a Research Foundation to aid the former USSR in various fields of civil research. It will be modeled after the International Center for Science and Technology that links France to Germany and the United States, and whose goal is to help reconvert military, and especially nuclear, companies into civilian ones.

The French minister took advantage of a stopover in Moscow to sign the collaboration agreement with Mr. Saltykov. He was there on his way back from Baikonour in Kazakhstan, where he watched the departure of the third Franco-Russian space mission, the Antares, on 27 July. The next day Mr. Curien signed a protocol spelling out the exact conditions and prices of the four other Franco-Russian flights that were planned before 2000 in the skeleton cooperation agreement[1].

Footnotes

1. See chapter on "Space."

EUROPE-ASIA RELATIONS

Ericsson, Toshiba To Form Digital Mobile Phone Venture

92WS0807K Chichester INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE in English 24 Aug 92 p 19

[Article: "Ericsson and Toshiba To Form Joint Venture"]

[Text] Ericsson and Toshiba Corporation have announced that they are to establish a joint-venture company in Japan which will develop and manufacture Japanese-standard digital mobile telephone systems. The two companies said they hope the alliance will lead to further cooperation between them in the telecommunications area.

The new company, to be called Ericsson Toshiba Telecommunication Systems K.K., will be established on September 1, 1992 and headquartered in Yokohama. Initially capitalised at ¥200 million, the venture will be owned 60 percent by Ericsson and 40 percent by Toshiba. Ericsson intimated at the beginning of this year that it was seeking a Japanese partner (See ITI issue 323).

Ericsson Toshiba Telecommunications systems will design, supply, install, maintain and service digital mobile telecommunications systems for the Digital Phone group of companies that are scheduled to start operation in 1994. The alliance is believed not to include production of Toshiba's own cellular handsets at present.

In Japan, the 1.5GHz frequency band was allocated to digital cellular mobile communications in 1991, and two new digital cellular mobile phone service companies that will offer nationwide communication networks were established. One of them, Digital Phone group, will construct nationwide stations by around the year 2000, under the management of regional operating companies. Digital Phone will compete against NTT, Japan's domestic telephone company, and three or four others, not all of which would have a nationwide network.

Three regional companies, Tokyo Digital Phone K.K. (Tokyo area), Kansai Digital Phone K.K. (Osaka area) and Tokai Digital Phone K.K. (central Japan area) have already been established.

Ericsson Radio Systems is scheduled to ship digital cellular mobile base stations and exchange systems to Tokyo Digital Phone and Kansai Digital Phone (See ITI issues 341 & 348). After its establishment, Ericsson, Toshiba Telecommunication Systems will act as a representative organisation for Toshiba and Ericsson in this equipment supply business.

Ericsson and Toshiba expect the new business to generate ¥32 billion in sales in 1994.

Lars Edvardsson will be President and CEO, and Yutaka Hatano will be Vice-President.